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# NAVAL POSTGRADUATE SCHOOL
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# THESIS

**VALIDATION OF THE NAVY RECRUITER
SELECTION TEST BATTERY (RSTB)**

by

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The purpose of this thesis is to validate the Navy Recruiter Selection Test Battery (RSTB) as a predictor of recruiter success. A sample of recruiters who took the test battery in 1982 was studied with respect to productivity on recruiting duty in subsequent years. The measure used to determine success on recruiting duty was average yearly production rates. Various statistical techniques, including cross tabulations, correlation analysis, and multivariate regression analysis, were used to determine the relationship between RSTB scores and recruiter success. The outcome of this research suggests that, overall, the RSTB is not able to predict recruiter success with a high degree of accuracy. Biodemographic characteristics of the recruiters were also examined to determine if they could be used, in conjunction with the RSTB, to predict success. The analysis suggests that the occupational specialty of Navy Counselor could be useful in screening for potentially successful recruiters. Keywords.

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Validation of the Navy Recruiter Selection Test Battery (RSTB)

by

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# ABSTRACT

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# I. INTRODUCTION

Recruiting qualified enlistees into the Armed Forces these days is no simple task. Under the confines of maintaining an all-volunteer force, recruiters are struggling to make their recruiting quotas. A shrinking pool of recruit-age, eligible males, competition from universities and the civilian job market, and a strong economy contribute significantly to the difficulties faced in recruiting duty.

The Navy made its fiscal 1988 recruiting goals, but only barely. [Ref. 1] The delayed entry program (DEP) pool--recruits waiting to enter the Navy--is shrinking. This puts pressure on recruiters to enlist recruits immediately rather than having the DEP cushion to fall back on. Fiscal 1989 is looking even more bleak. The recruiting budget is down nine percent from the previous year and economic conditions are not improving from the Navy's perspective. These added pressures make recruiting duty even less attractive to members of the fleet. Additionally, concern for recruiter morale is increasing.

The Navy believes it can alleviate its recruiting difficulties by increasing recruiter billets, and by spending more on educational incentives and advertising. However, this approach only focuses on the supply side of the issue. The Navy and the military need to ensure that they receive the greatest possible efficiency from the

recruiter force. This entails selection of the personnel most likely to succeed in recruiting duty. If only successful recruiters are employed, the likelihood that quotas will be filled and that the Navy will be able to meet its mission is increased.

The costs of utilizing an unsuccessful recruiter are multifaceted. Poor recruiter-job matches lead to decreased productivity. This decreased productivity can result in replacing the individual, which increases permanent change of station and temporary additional duty costs. It also increases training costs. The unsuccessful recruiter, who probably was a top performer prior to recruiting duty, may also affect those around him or her, both during the recruiting tour and afterwards. A negative attitude may sour performance in future assignments or may lead to a premature separation from the Navy. These costs to both the Navy and the unsuccessful recruiter may be too high.

## A. PURPOSE

The purpose of this thesis is to validate the Navy's Recruiter Selection Test Battery (RSTB) as a predictor of individual success on recruiting duty. The thesis will also examine the possibility that certain individual characteristics may be used to predict recruiter success as well or better than the RSTB. If the RSTB can be used to select recruiters with the highest probabilities of success, the costs of failure can be avoided to some

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extent. The Navy gets a better recruiter force and recruiters who succeed will be happier.

## B. BACKGROUND

From 1972 to 1976, Navy Recruiting Command (NRC) used a personality test, the 16PF-m, to screen and select recruiters. This test was designed to measure sales ability and motivation levels of the potential recruiter. It was validated by S. Krug of NRC using Commanding Officers' nominations of recruiters from the top and the bottom performance levels of personnel on recruiting duty. [Ref. 2] Multiple regression analysis produced a .40 ($p < .01$) correlation coefficient between the test and performance. When the test was cross-validated, the coefficient was .25 ($p < .05$). However, the use of this test was discontinued in 1976 because NRC and the Chief of Naval Personnel agreed that it did not truly predict sales ability.

The Navy Personnel Research and Development Center (NPRDC) began working in this same area in 1975 in an attempt to develop a good predictor of recruiter success. NPRDC researchers first identified behaviors that contribute to recruiter effectiveness and scales to measure those behaviors. [Ref. 3] These scales were then used to validate results of a test battery that was administered to 267 recruiters from ten different Navy Recruiting Districts (NRD). This preliminary validation revealed a number of predictors that were related to performance.

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NPRDC proceeded with another validation in 1981. [Ref. 3]. It was conducted with 194 recruiters from seven NRDs. Performance measurements consisted of production data for a six-month period and ratings gathered from peers and supervisors in four areas of performance. The correlation coefficients between the recruiters' ratings and performance on the test battery were .43 in selling skills, .46 in human relations, .40 in organizing skills, and .43 in overall performance. The overall correlation between recruiter productivity and test performance was .27. Figure 1.1 represents the practical impact of this relationship. Note that 66 percent of the recruiters scoring in the top 20 percent on the composite score were in the upper 50 percent in production, compared to 34 percent of those scoring in the lowest 20 percent. The researchers at NPRDC were convinced that this test was an effective measure of recruiter success--they recommended that the Navy and Marine Corps (USMC) implement this test to aid in selection of recruiters.

Prior to implementation of the test, the USMC requested that NPRDC conduct further validation for selecting USMC recruiters and drill instructors. Three more investigations were undertaken. [Ref. 4]. The first was a concurrent study of 1,005 USMC recruiters. The most notable result was that recruiters scoring in the lowest 20 percent of the exam also had low production rates. The correlations between the composite test score and measures

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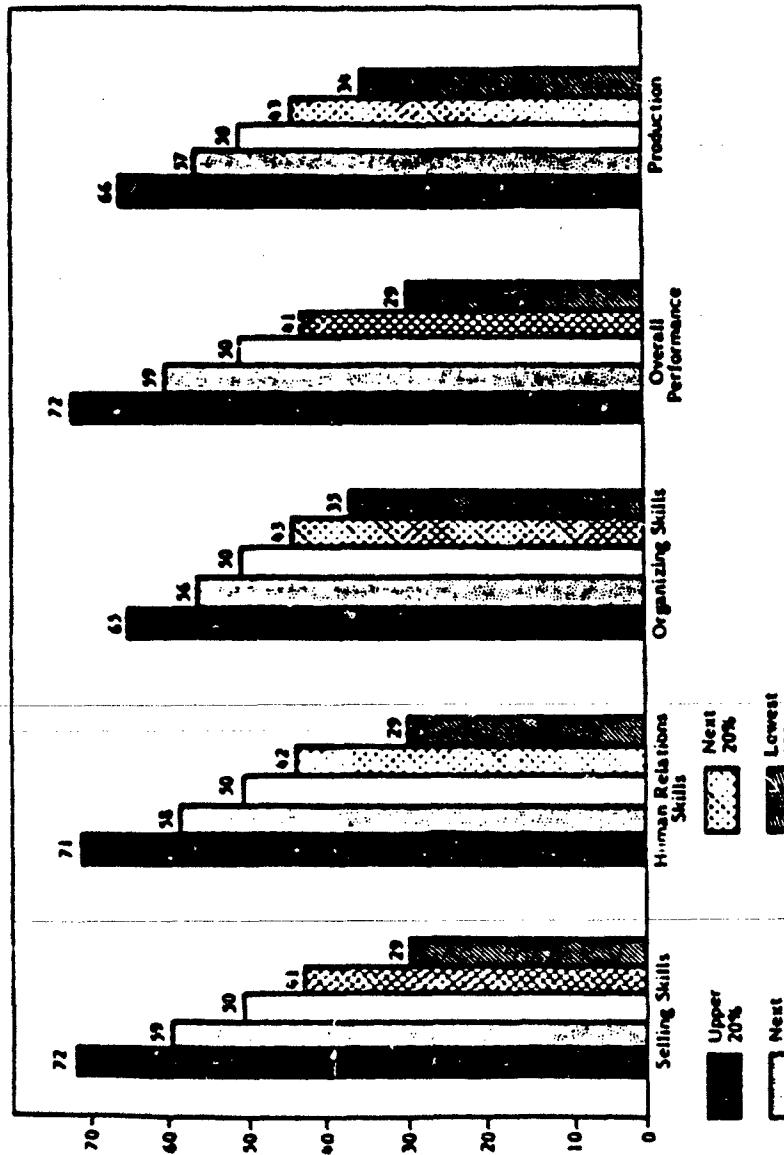
Figure 1.1 - Percent Successful Recruiters
(Where Upper 50 Percent is Considered Successful)

Source: Ref. 3

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of performance were .22 for productivity and .20 for peer and supervisor ratings, both significant at the .001 level. Figure 1.2 provides a further breakdown of the relationship between the composite score and recruiter productivity.

The second procedure was a validation using Marines who were tracked through recruiting school and then for one year of recruiting duty. Results were very similar to the concurrent study. Recruiters whose scores fell in the lowest 20 percent of the composite scores produced significantly fewer enlistees. However, there was only slight differentiation among the higher scoring subjects. The correlation between production and the composite score was .22 (p < .01). Figure 1.3 depicts the relationship between production and composite score in more detail. The drill instructor study revealed that the test correlated at .32 (p < .001) with drill instructor school completion. Again, NPRDC recommended that the USMC and the Navy implement this special assignment battery.

One may question whether these correlation statistics should serve as a basis for setting Navy-wide selection policy. However, NPRDC's original goal in developing this test battery was to identify, fleet-wide, those personnel most suited for recruiting duty. Comparing the number of recruiters selected to the total number of prospects in the fleet, the selection ratio becomes quite small. Therefore, with higher selectivity, a validity score on the test of .20 represents an increase in the probability of correct
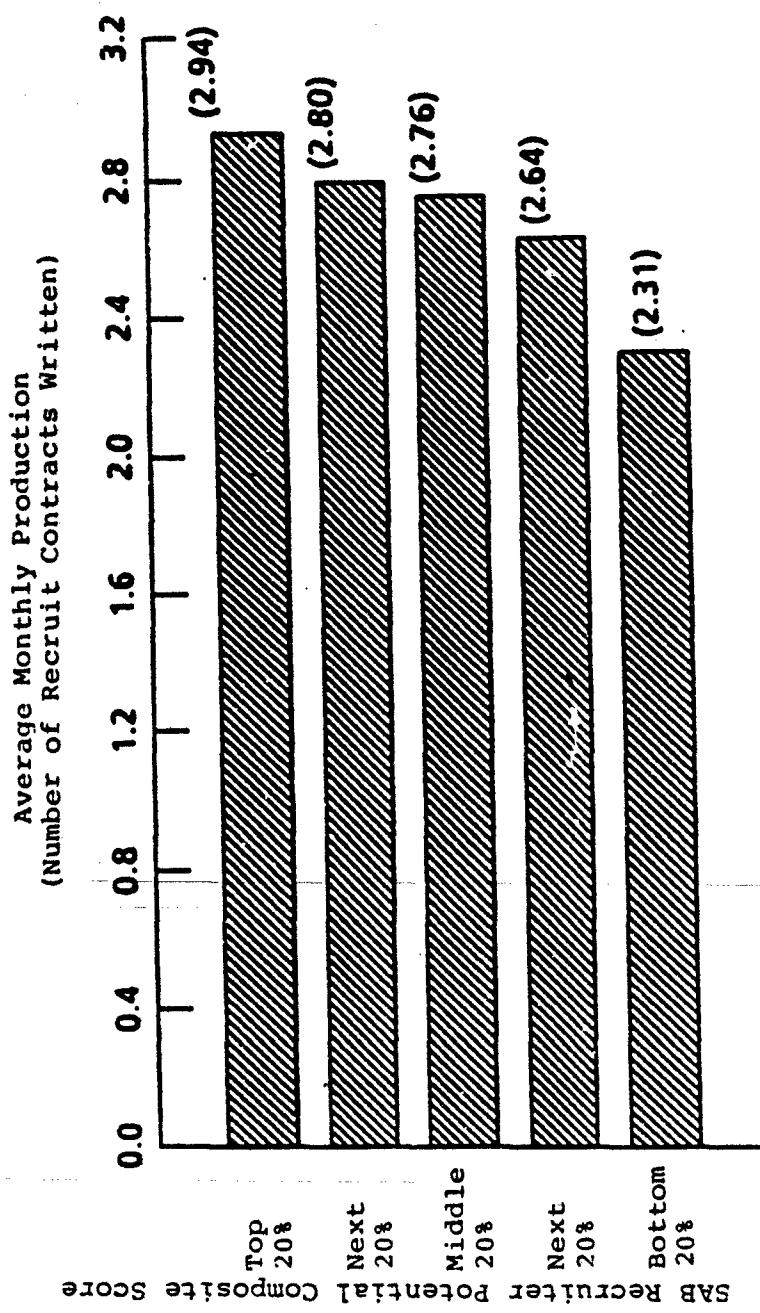
Figure 1.2 - Recruiter Potential Composite Scores and Average
Monthly Production (Concurrent Study)

Source: Ref. 4

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**Average Monthly Production**
**(Number of Recruit Contracts Written)**

Source: Ref. 4
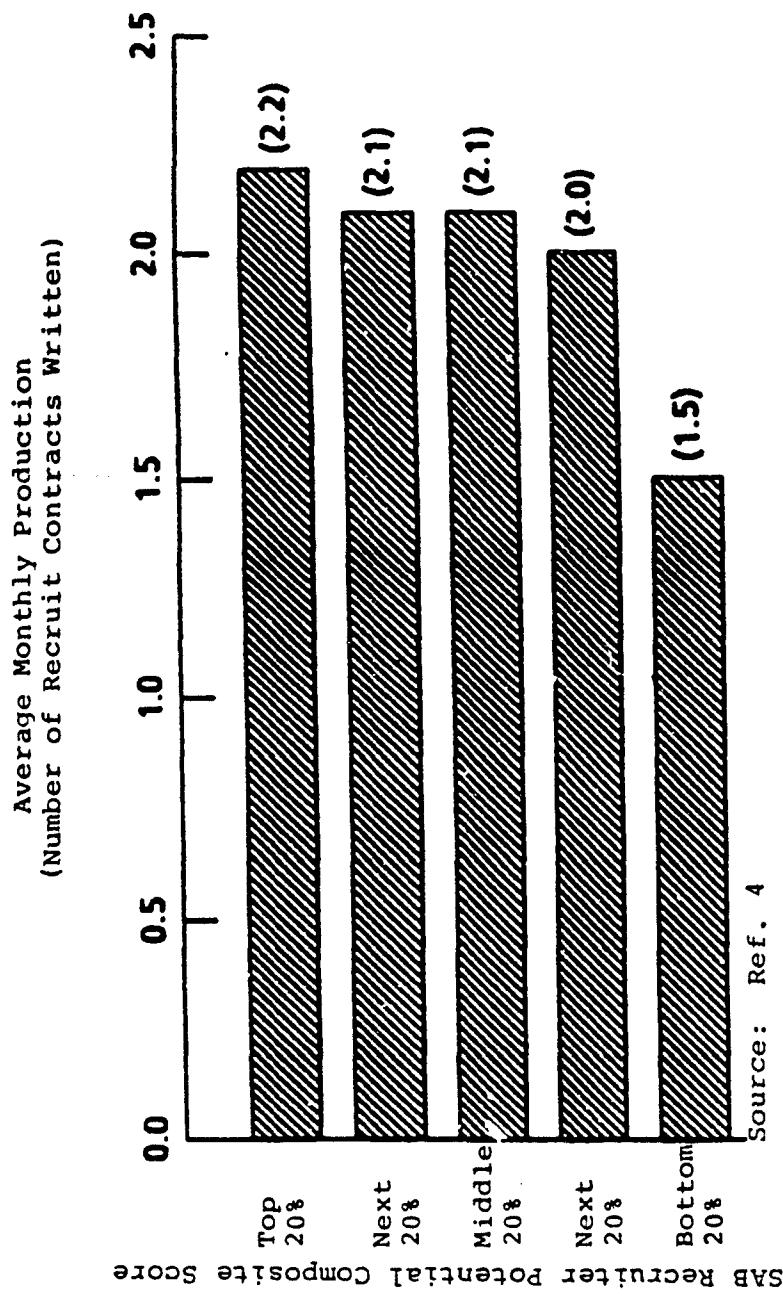
Figure 1.3 — Recruiter Potential Composite Scores and Average
Monthly Production (Predictive Study)

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decisions (selection of successful recruiters) over having no added screening. [Ref. 5].

The RSTB is a composite of vocational interest items (the Strong-Campbell Interest Inventory), self-descriptive lists, and biographical data. Scoring of the test produces a composite recruiter potential score. This score can then be broken into measures of the individual's selling, human relations, and organizing skills and overall performance. In 1981, NRC, attempting to implement the test, encountered complications with copyright infringement on a portion of the test. By 1982 these problems were resolved and the battery was administered to 270 Navy Enlisted Recruiter Orientation (ENRO) students, but the answer sheets were not processed at that time.

The USMC has administered the test battery since 1985 to students when they arrive at their recruiter school in San Diego, California. The test results were, at one time, utilized to "red flag" those students who may need special attention. The results were also compared, through observation, to recruiter performance at school to verify the success of the USMC's rigorous screening process. [Ref. 6] According to a point paper written by Mr. C. Kannapel of NRC:

> (USMC) recruiter school staff report noticeable improvement in trainee quality and a decline in attrition from recruiter school and the recruiter force. Unfortunately, they lack the empirical evidence needed to attribute the improvement directly to the use

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of the Special Assignment Battery (USMC form of the RSTB), policy changes and procedural changes which were implemented coincidentally. [Ref. 6]

The Marine Corps is now only testing students to gather this empirical evidence and make a determination about the test's usefulness [Ref. 8].

The USMC is not using the RSTB in the fashion that NPRDC originally envisioned. However, if testing were implemented fleet-wide, NPRDC hypothesized that over one-half of the attrites from Navy recruiter duty could be avoided. The Navy Recruiter Orientation Unit has a six- to seven-percent historical rate of attrition from that school alone [Ref. 9]. The goal of this thesis is to explore NPRDC's hypothesis and to give NRC the impetus to implement indicated improvements in current selection procedures.

## C. ORGANIZATION

This thesis is organized as follows. Chapter 2 presents a review of the literature that describes other recruiter selection methods and criteria that have been researched over the years. Chapter 3 discusses the methodology utilized in validating the RSTB. It also contains a description and rationale for the success criteria used in this process. Chapter 4 presents data collected regarding the sample recruiters' performance in the field and on the RSTB and a description of the biodemographic characteristics of these recruiters. The

results of the validation are also discussed. Finally, Chapter 5 provides some conclusions about the validity of the RSTB and recommendations about its use. Additional research questions are also examined here.

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## II.   LITERATURE REVIEW

### A.   FOREWARD

Many studies have been undertaken in an attempt to
develop the ability to predict recruiter success.  The Navy
and the Army appear to be the most interested in this area.
The Air Force has historically not had the problems with
recruiting experienced by the other services.  However,
with the future outlook of difficulties for recruiting,
this topic will be important to all services.  Paper and
pencil tests apparently have the longest history in being
examined for their usefulness in selection procedures.
Other methods such as biographical information, interviews,
assessment centers, and most recently, expert systems also
have been researched.

One of the biggest complaints regarding past research
in this area has been the lack of cross-validation of
encouraging studies.  This occurs either because cross-
validation is not attempted or the results of a cross-
validation are not as promising as the original study.
Cross-validation is a procedure used to test validation
results.  The prediction results derived from one sample
estimation are applied to a second, separate sample.  This
is designed to yield an unbiased, consistent estimate of
the population value.  When this procedure is performed,
however, researchers run the risk of introducing added bias
resulting from sampling techniques.

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Another common complaint is that criteria used to judge recruiter success are not very accurate. Researchers assert that productivity data are influenced by many other variables which are often outside the researcher's control. Other measures, such as supervisor ratings or individual performance ratings are subject to bias. This may all be true. However, this is an imperfect world, and one must make use of what is available. Additionally, all services use production numbers as their measure of a recruiter's performance. Until this is changed, numbers remain the relevant criteria on which to judge recruiter effectiveness.

The following is a discussion of specific research efforts that have been pursued in this area of predicting recruiter success. This literature appears in chronological order to show the progression of this topic.

## B. LITERATURE

### 1. Abrahams, Neumann and Rimland

In April 1973, with the advent of the All-Volunteer Force, researchers became interested in studying methods to improve the chances of success for the all-volunteer military. Abrahams, Neumann and Rimland examined the use of the Strong Vocational Interest Blank (SVIB) as a predictor of recruiter success. [Ref. 10]. A group of the least effective and a group of the most effective (judged by their Commanding Officers) recruiters from 42 Navy recruiting stations were administered the SVIB. Randomly

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selected SVIB's from 178 recruiters were used to establish scoring weights for the test items. The remainder of the sample was used to validate the scale of scores. After dividing the scores into four different groups, the results showed that the top group of scores came from three-times as many effective as ineffective recruiters, and the bottom group came from ineffective recruiters three-times as often. Recommendations resulting from this work were to create a surplus of potential recruiters so that only those with the greatest likelihood of success need be selected. A method suggested to increase the pool was a shipmate nomination system. This would entail having, ideally, successful recruiters nominate former shipmates. These researchers also recommended further developmental effort on the SVIB to bring it to its full level of effectiveness, along with the development of a biographical information scale and better criteria to judge recruiter effectiveness. The SVIB was obviously a precursor to the current RSTB.

### 2. Bennett and Haber

This study, completed in June 1973, investigated the factors that influence the productivity of individual Marine recruiters. [Ref. 11] Bennett and Haber selected 29 recruiting stations throughout the United States to provide gross productivity data on 259 recruiters. The figures were based on the average number of recruits enlisted per month per recruiter. Individual characteristics of each recruiter were separated into three types of variables.

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Selection, deployment and performance evaluation variables were used as explanatory variables of recruiter productivity in two multiple regression models. Selection variables were described as information known about the person prior to recruiting duty, such as General Classification Test (GCT) scores, age, race, education level, voluntarily on recruiting duty, prior career planner or drill instructor experience, number of dependents and whether recruiting was believed to be a financial burden. Deployment variables consisted of geographic location of the duty and types of utilization of the recruiter. There were 16 total explanatory variables considered. One model was generated for high enlistment rate areas and one for low enlistment areas based on enlistment rates from 1971. This was done to account for an area's effect on recruiter productivity. From both models, these researchers were able to come to the following conclusions:

a. Individuals who had been career planners were likely to perform better than average recruiters.

b. Recruiters assigned near their home areas may have an advantage in recruiting enlistees.

c. A recruiter in an urban area appeared to have a better chance than one in a rural area of being highly productive.

d. Individuals who felt that recruiting was a financial hardship were likely to be less productive.

The individual characteristics of the recruiter appeared to have insignificant impacts on success. This study was not cross-validated.

### 3. Best and Wylie

In a Naval Postgraduate School thesis (June 1974), Best and Wylie conducted an analysis to determine the characteristics of above-average Navy recruiters and to give these recruiters a forum for their complaints. [Ref. 12]. Forty-nine recruiters from the San Francisco district were surveyed using a questionnaire of four open-ended question areas. The Commanding Officer from the district evaluated each recruiter on effectiveness using a scale from one to five. Following an initial cross-tabulation of the various survey responses and biographical data, five independent variables were used in a multiple regression equation to predict recruiter effectiveness. These variables were: area where the recruiter spent his or her youth (rural, suburban, urban), proximity of this area to a major body of water, age, General Classification Test score, and years of active service. The proportion of variance in the dependent variable explained by this model was .34. However, when the attempt was made to cross-validate this model, the correlation between predicted and actual performance was only .11.

Other findings from this thesis included recruiters' statements that the most positive aspect of recruiting duty was the independence of the duty and the least was public speaking. These researchers concluded that the development of good measures of recruiter effectiveness was important, despite their disappointing

results.    They also concluded that the 16PF-m, the recruiter selection method at that time, could potentially be a useful tool and further validation of it should continue.

### 4. Borman, Hough and Dunnette

In response to the problem of inadequate measures of recruiter performance, Borman, Hough and Dunnette looked at over 800 critical incidents in their research published in February 1976. [Ref. 13] These critical incidents were generated by input from 37 Navy recruiters and supervisors from all recruiting areas. The researchers then reduced these examples into eight representative behavior observation scales. The scales decided upon to judge recruiter performance were:

    a. Locating and contacting qualified prospects.

    b. Gaining and maintaining rapport.

    c. Obtaining information from prospects and making good person-Navy fits.

    d  Salesmanship skills.

    e. Establishing and maintaining good relationships in the community.

    f. Providing knowledgeable and accurate information.

    g. Administrative skills.

    h. Supporting other recruiters and the command.

The researchers felt that using only these eight dimensions may overlook or underrate a recruiter who may have a different style for getting the job done.

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Therefore, they developed four different examples of "very high", "high", "low", and "very low", performance in each of the eight categories to allow for these individual differences.

A second approach taken in this study was a multidimensional scaling (MDS) approach. This led to five dimensions to describe the content of a recruiter's job. These were: gathering information about applicants; planning and organizing recruiting practices--looking ahead to future requirements; expending extra effort to aid applicants or recruits; salesmanship--listening to the prospect and then making an appropriate and effective sales pitch; and expending extra effort related to prospecting activities. These five dimensions were then compared to the results of the behavior scaling. The conclusions from this comparison suggest that MDS may provide "cleaner", less highly correlated performance categories than the behavior scales.

However, a field test was conducted using 27 recruiters and supervisors from the Minneapolis, Minnesota area and the behavior scales. Results from this showed that peer and self-ratings could contribute significantly to provide criterion performance scores because supervisors do not normally possess detailed knowledge of recruiters' performance in specific facets of the job. Some additional recommendations stemming from this study included using the rating scales to assess the validity of procedures

presently employed to select individuals for recruiting duty. The information contained here should also be used to inform Commanding Officers, potential recruiters, and newly assigned recruiters about what recruiting duty is and what performance standards should be met.

## 5. Arima

In June 1978, J. Arima had a study published entitled "Determinants and a Measure of Navy Recruiter Effectiveness". [Ref. 14] Using 268 recruiters from Navy recruiting stations in California, Arima developed a model to explain recruiter effectiveness. He sought to differentiate in the measure of effectiveness how much individual characteristics and the operating environment affected productivity. He also examined several types of productivity measures, taking the quantity and quality of recruits into consideration. Conclusions resulting from this effort were that the individual's characteristics and abilities contributed as much as the recruiting area in explaining total production. Arima also stated that the desired measure of effectiveness should be the ratio of actual productivity to expected productivity. This allows for differences between recruiting areas. One of his final recommendations was that this study should be conducted on a larger, more representative data base to gain better understanding of how environmental factors affect recruiting.

## 6. Shupack

In this Naval Postgraduate School thesis (June 1979), Shupack intended to provide additional objective criteria to relate to recruiter effectiveness. [Ref. 15] Her measure of effectiveness consisted of the number of times the 1,262 members of her sample appeared on the Navy Recruiting Command Honor Roll (at least five enlistments per month). The researcher then conducted multiple regression analysis using pay grade, education, years of active duty service, General Classification Test score, sales aptitude battery score, Navy enlisted occupation (rate) and age of the recruiter as independent variables. She used two models, one to predict success and one to predict mediocrity or failure. The results showed that the first model explained 14 percent of the variance in recruiter effectiveness. The second model accounted for 21 percent for unsuccessful recruiters. The best predictor in model one was the recruiter's education level and for model two it was rate. She concludes:

> Increased knowledge of the impact of various factors on recruiter performance would make it possible to devise more effective training programs and help to reduce costs due to recruiter turnover. Although the foregoing discussion has provided only a brief explanation of the other factors which impact on recruiter effectiveness, it should be clear that research efforts which help clarify how these factors affect the recruiter would contribute to the goal of providing for the most efficient and effective recruiting force possible. [Ref. 15: p. 74].

### 7. Borman and Fischl

Another method of evaluating recruiter performance has been examined in this work published in June 1981. [Ref. 16] Borman and Fischl examined the use of assessment centers as a way to observe and evaluate performance directly. The performance observed here was only related to training, not job performance. A problem with the use of assessment centers to determine probability of success is that the recruiter must have the desire to be there. In this day of involuntary assignments to recruiting duty, motivation has become a problem and, therefore, the focus of attention. Assessment centers have now changed their objective from one of selection of recruiters to providing potential recruiters a realistic job preview and positive feedback to enhance their motivation. [Ref. 2]

### 8. Hirabayashi and Hersch

Hirabayashi and Hersch conducted an analysis of Navy Recruiting Districts (NRD) to determine what makes a district excellent, (published in December 1985). [Ref. 17] They interviewed over 100 officers, civilians and enlisted personnel at Navy Recruiting Command (NRC), area headquarters, Navy Recruiter Orientation Unit, and members of the Standardization and Audit Team. The definition of excellence in recruiting duty employed by these researchers was the ability to make goal, in terms of both quantity and quality, consistently, and with integrity. The tools found to be useful in meeting this goal were thought to be

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attitude, appearance, planning, training, marketing, and administration.

These researchers then looked at two recruiting districts that were universally agreed to be excellent. What they found from 67 interviews at these districts was that there are seven general areas where effectiveness is measured. These areas include: leadership, systems in place (making effective use of the tools available), taking care of people, communication, teamwork, command climate, and making goal with integrity. These seven areas could presumably be developed into individual performance criteria; however, it was not attempted in this work. The recommendations resulting from this thesis consisted of:

a. Select quality recruiters to improve performance.

b. Making goal should not be the only measure of effectiveness.

c. Improving recruiting's appeal to the sailors in the fleet.

### 9. Zellweger

This Naval Postgraduate School thesis, completed in December 1986, was designed to identify personal attributes of the successful recruiter. [Ref. 2] Using the input from five United States Army recruiting experts, expert systems for each expert were constructed to profile the successful recruiter. An expert system is a knowledge-intensive computer program that solves a problem that normally requires human expertise. Expert systems can be used to

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assist in decision making by asking relevant questions and explaining the reasons for adopting certain actions-- reasons agreed upon by experts in the subject [Ref. 18]. Many attributes were examined in this research, ranging from various skill levels to background information (for example, age and gender) to personality to previous experience of a recruiter. The most important attributes of effective recruiters that the experts agreed on were integrity, motivation, listening, informing, sales and recruiting experience, and training.

### 10. Thomas, Kocher and Gandolfo

This report of October 1987 appears to be a follow-on to Zellweger's study in the use of expert systems to predict recruiter success. [Ref. 19] A model using six reserve and ten active duty Army recruiters was developed. This model was designed to measure the importance of recruiter attributes in six dimensions. These included communication skills, demographic characteristics, military experience, personality, behavior characteristics and specific experience. The reserve experts judged cognitive ability (Armed Forces Qualifying Test scores), persuasive ability, self-motivation, higher rank for the person's length of service, and sales experience to be the characteristics most important to the successful recruiter. The active duty recruiters preferred an individual who possessed public speaking experience and who had many years of active service (not related to rank) but who had

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otherwise identical characteristics to the reserve experts'
"ideal" recruiter.  The expert system  developed was tested
on  20  hypothetical  recruiters  and  a  fairly consistent
pattern of selection and rejection emerged.

### 11. Lorry

This recent effort (March 1989) is  another look at
the  use  of  expert  systems.  [Ref. 20]  Lorry identified
eight  attributes  of  the  successful  recruiter following
interviews with  13 recruiting  experts.  She then designed
an expert system which was able to recommend recruiters for
recruiting duty based on  the  experts'  assessments  of
important characteristics.   To  validate  the  use  of the
program, a  sample  of  29 current recruiters was selected
from NRD Los  Angeles,  California.   The  system  gave an
accurate recommendation on 21 of these recruiters (based on
production per  month  as  their  measure  of performance).
This result equates to a 72.4 percent accuracy rate.  Lorry
provided a  sample  Commanding  Officer's  screening  form
which, if  answered objectively,  could be used as input to
an expert system  similar  to  the  one  developed  in this
study.   The  use  of this method for recruiter selection,
according to  Lorry  and  others,  would  provide  an added
"confidence factor" when selecting recruiters.

### C.  SUMMARY

It should  now be  readily apparent that the subject of
predicting recruiter success has been studied quite

extensively over the years. Researchers have produced many hypotheses regarding the correct measure of a recruiter's ability. There are also many different results from these studies.

One common conclusion shared by these studies is the need for the Armed Forces to select recruiters who are effective. It appears that improvements to the current method are highly recommended. The current method only requires a Commanding Officer to recommend an individual for recruiting duty via a screening sheet. This form is designed to ensure that the candidate has no medical, dental, alcohol, drug, or financial difficulties. A Commanding Officer is also encouraged to counsel prospective recruiters about the academic requirements of recruiting school and to relate the need of salesmanship, motivation, and communication abilities usually needed to be a recruiter [Ref. 21]. However, whether this counseling occurs is another question. Additionally, whether this counseling and its results matter when detailers must fill recruiter billets is of equal importance.

Another common finding in this research is that the good recruiters share some common characteristics, such as motivation, sales ability, and intelligence. The RSTB, which has gone through several validations already, is perceived by this author to possess the ability to predict recruiters' qualifications in these areas and more. The

goal of this thesis is to evaluate the relationship between
the RSTB and recruiter performance, once again.

# III. METHODOLOGY

## A. DATA SOURCES

### 1. Recruiter Selection Test Battery (RSTB)

To examine the relationship between an individual's score on the RSTB and his or her performance on recruiting duty, it was necessary to score the RSTBs from the Navy Enlisted Recruiter Orientation (ENRO) students who took the test in 1982. Scores were generated for the individual's human relations skills, selling skills, organizing skills, and overall performance on the test. A recruiter potential composite score and percentiles were also generated. In the Borman et al. validation study of 1981, a sample of 267 recruiters' responses on personality and vocational interest items were first correlated with the four subscales of the RSTB. The resulting correlation matrices were analyzed via the principal components method. From this analysis, constructs were developed to describe the RSTB responses in relation to the four subscales. Some examples of these test constructs and how they are related to each performance category are shown in Table 1. [Ref.3]

The self-description inventory of the RSTB is composed of three sections: (1) a list of 100 self-descriptive statements; (2) a list of 95 adjectives; and (3) a list of 45 comparison adjectives. Each list requires the respondent to answer "yes, this adjective describes me (better)" or "no, it does not." The background

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# TABLE 1

## CONSTRUCTS IDENTIFIED FOR EACH PERFORMANCE CATEGORY

| Performance Categories | Construct |
|---|---|

### Personality Items

| Performance Categories | Construct |
|---|---|
| Selling Skills | 1. Good Impression.<br>2. Impulsive vs. order, planning ahead.<br>3. Enjoying being center of attention.<br>4. Working hard, being happy vs. un-happiness, giving up easily. |
| Human Relations Skills | 1. Likes working, being with people.<br>2. Spontaneity, impulsivity. rebellious, tendency to have bad moods.<br>3. Unhappy, lack of confidence.<br>4. Ambitious, working hard. |
| Organizing Skills | 1. Order, planning ahead, well organized vs. impulsive, "fast and careless."<br>2. Leading, influencing others, ambituous.<br>3. Unhappy, discouraged, feeling useless.<br>4. "Bad actor," unsocialized. |
| Overall Performance | 1. Doing more than expected vs. giving up.<br>2. Impulsive vs. order, methodological.<br>3. Leading, influencing others, dominant.<br>4. People oriented, open to people. |

### Vocational Interest Items

| Performance Categories | Construct |
|---|---|
| Selling Skills | 1. Leadership activities, occupations.<br>2. Interest in law and politics.<br>3. Interest in sports, competitive activities. |
| Human Relations Skills | 1. Interest in social activities.<br>2. Interest in teaching, counselling.<br>3. Interest in newspaper reporting.<br>4. Interest in sports and religion. |
| Organizing Skills | 1. Interest in upper management, politics.<br>2. Interest in bookkeeping, detail work.<br>3. Interest in leadership, responsibility. |

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## TABLE 1 (cont.)

### CONSTRUCTS IDENTIFIED FOR EACH PERFORMANCE CATEGORY

| Overall Performance | 1. Interest in law, politics, management. |
|---|---|
| | 2. Interest in sports. |
| | 3. Interest in teaching, counselling. |
| | 4. Interest in occupations that require extroversion, dominance, responsibility, and leadership. |

Source:  [Ref. 3]

questionnaire contains 136 questions concerning jobs and activities that the individual may have performed in the past. Vocational interests were determined from a check-list of 325 options that described a respondent's interest in particular occupations. The RSTB has a total of 701 questions for the recruiter to answer.

There were 271 answers sheets obtained from 270 ENRC students who took the test battery over the period 6 July 1982 to 1 October 1982. An average class at ENRO (now called Navy Recruiter Orientation Unit [NORU]) consists of approximately 35 to 40 students [Ref. 22]. A class is convened once every week. Therefore, there were most likely between 420 to 480 students at ENRO during the testing period. This sample of 270 recruiters represents approximately two-thirds to one-half of all of the students at the command over this three-month period. Since the sampling appears to be widely distributed, it is hoped that this sample of 270 recruiters is a random and representative sample of all recruiters.

In the analysis below, individual recruiters are tracked by their social security numbers. The records of four recruiters were declared void by the scoring machine at Headquarters Marine Corps due to the number of missing responses. Thus, the number of recruiters' scores available for analysis is 266.

2. **Productivity**

Measures of success for this sample were somewhat limited by a lack of data from Navy Recruiting Command (NRC). Productivity figures were not maintained by NRC for the time period that the recruiters in this sample were on recruiting duty. Other constraints, such as time and scope of this thesis, limited the ability to gather performance evaluation data or supervisor/peer rating data on this sample, as utilized in previous studies [Ref. 10 and 13]. Other research products have avoided using unaltered productivity data because the researchers felt that these data are inadequate, unrepresentative measures of success [Ref. 13, 14, and 15]. However, previous validations of the RSTB have made use of productivity as an indicator of success [Ref. 3 and 4]. Using this type of data for this research will enable comparisons between previous results and the results of this thesis.

To obtain productivity rates for this sample of recruiters, some improvisation was necessary. The Center for Naval Analyses (CNA) maintains data from the Personalized Recruiting for Immediate and Delayed

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Enlistment (PRIDE) system. PRIDE is designed to manage and control the recruiting process. [Ref. 23] It matches recruits with programs for which they qualify, it assigns recruits to A-schools, and it identifies specific jobs for which the recruit is most qualified. The PRIDE system is basically a reservation system for recruits. When a reservation is made, most of the data elements are reserved for recruit information. However, the recruiter's social security number (SSN) also is supposed to be recorded, as well as the area from which the individual is recruited and the fiscal year of the accession. Productivity of the recruiters in this sample is generated from this file. One potential drawback of using these data is that if a recruit goes into a general detail assignment, without first going to an A-school, the enlistment may not be recorded in the same system.

CNA was provided with a list of the recruiters' SSNs. The system provided recruitment numbers for 243 of the recruiters in the sample for fiscal 1983, 236 for fiscal 1984, 172 for fiscal 1985, and 120 for fiscal 1986. Average yearly production figures were calculated on those recruiters who were productive in at least fiscal 1983 and fiscal 1934. If the recruiter remained in the file for fiscal 1985, an average yearly productivity figure was calculated including that year. Of those seven recruiters who dropped out of the file between fiscal 1983 and fiscal 1984, one could potentially assume that they were not

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productive, had left recruiting duty and, therefore, were not successful. However, the reasons why recruiters are dropped from the file are varied and may not represent problems in meeting recruiting goals. For example, a recruiter may stop producing recruits due to a promotion to Recruiter-in-Charge or Supervisor. He or she also may have left recruiting duty for medical or retirement reasons. Therefore, this author does not feel that making an assumption about a recruiter being unsuccessful because of no observed production, is valid or warranted. The seven recruiters who did drop out of the production file between fiscal 1983 and fiscal 1984 were eliminated from the sample.

### 3. Loss

Another measure of success and a potential data source for this analysis is whether or not the recruiter remained on recruiting duty for the full three-year period that represents a normal recruiting tour. Again, decreased numbers of matches of recruiter SSNs in the productivity data may be attributable to those individuals who did not succeed at completing the full tour of duty.

The ideal data source for this information would be to identify those recruiters who were removed from recruiting duty for lack of ability to recruit or, in other words, those who transferred under the Freeman Plan. [Ref. 24] A Freeman Transfer is not prejudicial in design and is not to be used as a method of removing personnel who

have disciplinary problems. It must be initiated by Commanding Officers and can be designated as either "fault" or "no-fault." It occurs when a recruiter fails to meet the NRC requirement of averaging at least two new contracts per month by the fifth and sixth months of duty or when the average falls below two contracts per month for four consecutive months.

These data were not available from NRC for the time period desired. Therefore, an alternative was adopted to determine success--namely, those individuals were identified who separated from active duty prior to the completion of their three-year tour and who separated for reasons that may indicate lack of success. These data are available on the Enlisted Master and Loss file, maintained by the Defense Manpower Data Center (DMDC). If the individual separated between October 1982 and October 1985, a loss code was generated that could be used to indicate lack of success on recruiting duty. A total of 123 individuals were identified through DMDC's loss file. Table 2 shows a breakdown of numbers, dates, and explanations for the loss code. It should be noted that "loss", in this instance, is somewhat of a misnomer. Many "losses" were actually recorded at DMDC for transaction purposes (immediate reenlistment)--the recruiter did not separate. Other losses are attributed to non-problematic causes, including commissioning and retirement. It is not clear why certain people (e.g., those with medical problems

## TABLE 2

### CHARACTERISTICS OF RECRUITERS IDENTIFIED AS LOSSES ON ENLISTED MASTER AND LOSS FILE

| Separation Code Description | Frequency | Date of Sep.[a] | Was Recruiter Successful? |
|---|---|---|---|
| Unknown/Invalid | 2 | 841005 | Yes |
|  |  | 850606 | Yes |
| Expired Term of Service | 19 |  | Yes |
| Early Release/ Insufficient Retainability | 2 | 831031 | No |
|  |  | 851212 | No |
| Disability with Severance | 1 | 850131 | Yes |
| Temporary Disability-- | 2 | 850503 | Yes |
| Retired |  | 851018 | Yes |
| Height/Weight Standards | 1 | 851022 | Yes |
| Death--Non-Battle | 2 |  | Yes |
| Commissioned | 2 | 830630 | Yes |
|  |  | 830930 | Yes |
| 20-30 Years Service | 13 | 831031 | Yes |
|  |  | 840101 | Yes |
|  |  | 840731 | Yes |
|  |  | 841031 | Yes |
|  |  | 841130 | Yes |
|  |  | 841231 | Yes |
|  |  | 850131 | Yes |
|  |  | 850228 | Yes |
|  |  | 850831 | Yes |
|  |  | 850930 | Yes |
|  |  | 851031 | Yes |
|  |  | 851031 | Yes |
|  |  | 851105 | Yes |
| Discreditable Incidents | 1 | 840702 | No |
| Drugs | 2 | 840608 | No |
|  |  | 851115 | No |
| Unsuitability-- Unknown Reason | 1 | 850820 | No |
| Committed Serious Offense | 1 | 850122 | No |
| Transaction Code-- Immediate Reenlistment | 74 |  | Yes |

[a]Date of Separation = Year, Month, Day
Source:  Defense Manpower Data Center

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or those eligible for retirement) were selected for recruiting duty. The dates of these losses may provide some insight, but further inquiry into this question will not be undertaken at this time.

A difficulty encountered in these data is the lack of variability. As shown in Table 2, only seven individuals in the sample could be considered unsuccessful with certainty, based on the established criteria. Therefore, this basis of validation is not pursued any further.

### 4. Biodemographics

Other information is available from DMDC's files. From the Enlisted Master and Loss file, biodemographic information was provided on 267 of the recruiters in the sample. These data are used to develop variables to explain recruiter success. The purpose of this analysis is to hold biodemographic characteristics constant when predicting recruiter success as a function of the RSTB. This approach represents a multivariate analysis, which has not been used in previous validations of the RSTB. The Master and Loss file's information from DMDC was merged to generate complete data on each recruiter in one file.

## B. VARIABLE IDENTIFICATION

### 1. Dependent Variable

Success of a recruiter in this analysis is based on productivity figures. Because there were only 236 ultimate matches between RSTB scores, biodemographic data, and

production statistics, this number represents the total sample size for all analyses. Success in productivity can be defined in the same manner here as in NRC's criteria for Freeman Transfers: [Ref. 25]

> Production recruiters are required to attain a monthly productivity of 2.0 gross new contracts per month by the fifth and sixth month of duty. A production recruiter is defined as a recruiter who is directly involved in prospecting and writing contracts to bring applicants into the Navy and whose production of such new contracts is recorded in COMNAVCRUITCOM PRIDE reservation system. It does not apply to chief recruiters, zone supervisors, classifiers, RZ coordinators ....

This definition provides a very plausible explanation for recruiters disappearing from the PRIDE data file. Based on the productivity numbers generated from CNA's PRIDE data, and using the definition provided by NRC, productivity for the recruiters of this sample should have reached two new contracts per month by the middle of fiscal 1983. It should also have reached at least 24 new contracts in both fiscal 1984 and fiscal 1985.

For the first two years the average expected number of contracts is 18 per year. If the recruiter remained for fiscal 1985, 24 contracts are expected per year, on average. Success is thus defined as a binary variable where the recruiter either produced 18 or 20 contracts (depending on whether the recruiter was productive for fiscal 1983 and fiscal 1984 or productive during all three years) per year (success = 1) or he/she did not (success = 0). A second definition of success is also constructed

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when production exceeds 30 average contracts per year. The intention is to compare the two sets of results to determine if there is a difference in the power of the model between the two measures of success. A third measure of success is average production per year, which is used as a continuous variable. These three alternative measures of success provide the ability to examine changes in productivity related to the explanatory variables in a more detailed fashion.

## 2. Explanatory Variables

Explanatory variable selection is based on three criteria: previous studies, availability of data, and a hypothesized relationship between the variable and the individual's success. Each of the subscales of the RSTB is used. Raw scores for human relations skills, selling skills, organizing skills, and overall performance are included in the analysis. The recruiter potential composite percentile score is also considered independently of the subscales. Other variables used are discussed in greater detail below.

AFQT: Aptitude can be judged by the service member's score on the Armed Forces Qualification Test (AFQT) at entry into the military. A binary variable was constructed so that AFQT categories I, II, IIIA (reflecting scores at or above the 50th percentile) are set equal to one, and the lower AFQT categories equal zero. Because 36 AFQT scores were missing, it was necessary to replace them

with predicted AFQT scores. The scores were estimated using ethnicity (white/non-white) and high school (HS) graduation as explanatory variables and using the sample of individuals with AFQT scores. The resulting equation from this estimation is:

Predicted AFQT = 23.22 + 17.92(HS) + 27.25 (white). The amount of variation in AFQT scores accounted for by the explanatory variables ($R^2$) equals .24.

AGE: This variable was generated using the recruiter's year of birth. The recruiter's age in 1983 was calculated.

SINGLE, MARRIED, MAR1KID, MAR2KID4m: Binary variables were created from the marital status and 'dependents' fields on the Enlisted Master and Loss file. The marital status field equals one for unmarried personnel and it equals two for married individuals. The recruiter was included in the 'dependents' field, along with any family members. Therefore, the 'dependents' field has a minimum value of one, whether the recruiter has dependents or not. If a married recruiter has a spouse who is not actually a dependent, the 'dependents' field would still equal one. For the purposes of this thesis, when the 'dependents' field has a value of one or two and marital status equals two, the MARRIED variable equals one, (i.e., the individual is married only). Single recruiters (without dependents) are identified when marital status equals one and 'dependents' equals one. The MAR1KID

variable consists of those individuals with two dependents, primarily a spouse and one child (i.e., marital status equals two and 'dependents' equals three). MAR2KID represents those individuals with two or more children. The base case is a person who is single but has one or more children.

HS: This binary variable was created from the education level field on the Enlisted Master and Loss file. This field contains the person's highest level of education, ranging from one (one to seven years of elementary school) to 12 (doctorate degree). Six represents a high school graduate with a diploma, an attendance certificate, or a General Educational Development (GED) certificate. Anyone with a value of six or greater in this field was converted so that the variable, HS, equals one; otherwise, HS equals zero. In December 1987, DMDC restructured this field to record GEDs and alternate education credentials separate from high school diplomas. This is particularly useful when retention and turnover issues of the military are studied. However, this breakdown cannot be used for this sample of recruiters.

WHITE: This variable, constructed from the race/ethnicity field, is also a dichotomous variable. White recruiters are placed in one category; all others made up the second category.

MOS: This data element is a service code for the member's primary occupation (or Military Occupational Specialty). An individual's rating is contained in the first three positions of the field and the Navy Enlisted Classification code is in positions four through seven. For the purpose of this analysis, only rating is used. The ratings of the recruiters in this sample have been consolidated using the Department of Defense Occupational Conversion Manual [Ref. 26]. The categories were turned into dichotomous variables in the following manner:

MOS1: Navy Counselors.

MOS2: Those recruiters with occupations that are strictly administrative, including: YN, PN, DP, AZ, AK.

MOS3: Specialists including: AC, AG, BM, CTO, CTR, DT, GMG, GMM, MS, OS, PH, RM, SH, SM.

Other
MOS: Repairers, including: AB, ABE, ABH, AD, AE, AME, AMH, AMS, AO, AQ, AS, AT, BT, BU, CE, CM, DS, EM, EN, EO, ET, FC, FTM, FTG, IC, MM, MN, MR, OTM, OTA, STG, STS, SW, TD, TM, UT

AREA: A binary variable was generated for each of the six Navy recruiting regions or areas. These areas are shown in Figure 3.1 [Ref. 21]. Areas were reported on the PRIDE data file when contracts were made. This variable is intended to account for variations in productivity that can be attributed to the region in which recruiting occurs. The variations can include unemployment rates, eligible male populations, and basic attitudes toward the military.

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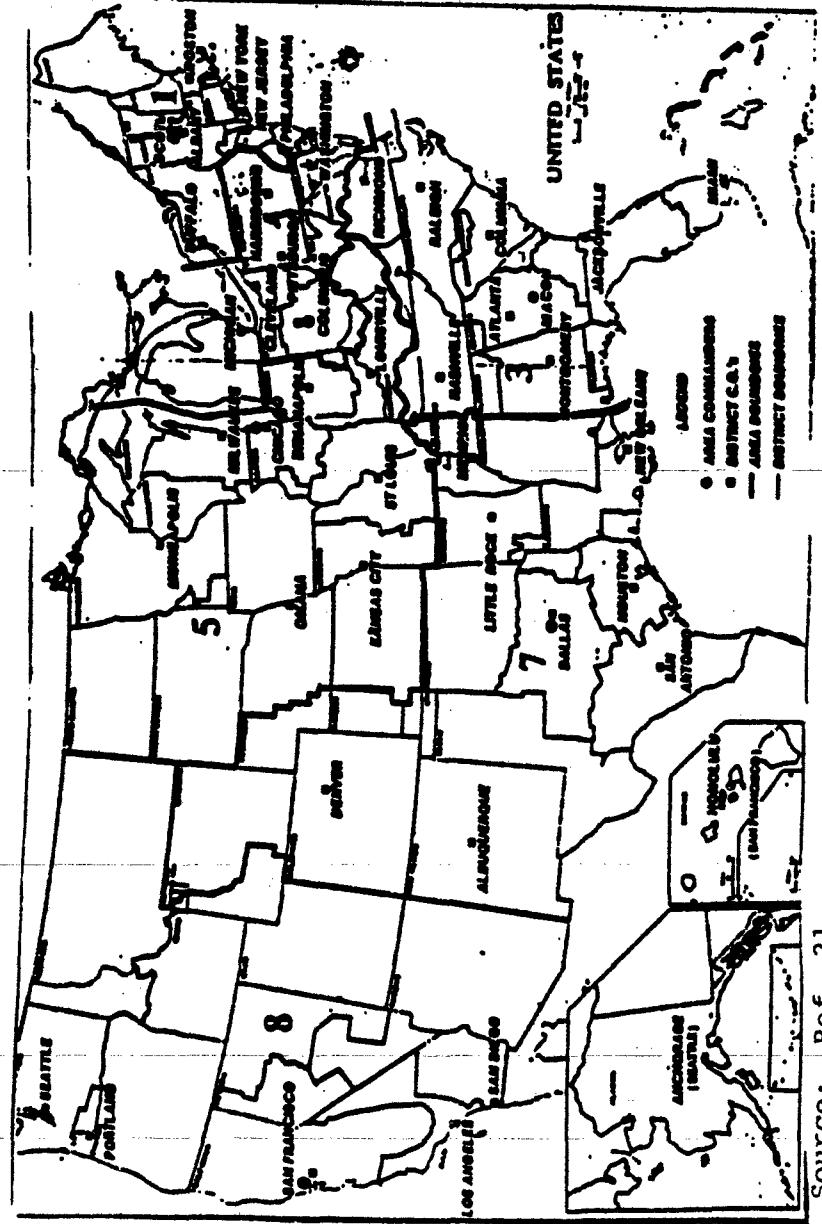
Figure 3.1 - Navy Recruiting Districts and Areas

Source: Ref. 21

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It should be noted here that these data are somewhat limited, and this limitation affects the analysis. There are 41 Navy Recruiting Districts (NRD) and differences across districts can have a large impact on whether or not recruiters achieve recruiting goals. Motivation can be one of the biggest factors. A particular district's Commanding Officer or Recruiter-in-Charge can have a dramatic effect on the motivation of a recruiter and productivity levels. Other examples of such variations between individual districts include stress levels, proximity to a military base for support, and physical working environment. Unfortunately, PRIDE does not report accessions by district. Additionally, a sample of only 236 recruiters does not lend itself to the creation of 41 variables to account for differences between NRDs.

Sex and pay grade were two other elements provided which were considered for use in this analysis. Sex was not used because of lack of variability within the sample. There were only nine females who had exam scores and productivity figures. Pay grade was found to be significant in previous research concerning recruiter success [Ref. 15]. During preliminary analysis, however, pay grade was found to be highly and significantly correlated with age. Also, according to the enlisted recruiter detailing office at the Naval Military Personnel Command, potential recruiters must be in the pay grade of E-5 or above to be assigned to recruiting duty [Ref. 27].

Therefore, to avoid problems with multicollinearity and selection bias in the analysis, pay grade is not used as an explanatory variable.

The hypotheses underlying the selection of these variables to explain success on recruiting duty are generated by the author based on a reading of the literature. Theories to support specific hypotheses on recruiter success are in limited supply. It is anticipated that recruiters who finished high school and those with above average AFQT scores, because these are possible indicators of ability, will be more likely to be successful on recruiting duty. Also, individuals who are single with children or married with more than two children are expected to have higher levels of family-related stress. This stress may carry over into the working environment, thus decreasing a recruiter's productivity. Finally, the Navy Counselors (MOS1) are expected to possess the highest probability of success, followed by the strictly administrative types of individuals.

## C. STATISTICAL TECHNIQUES

This sample of recruiters is first examined using descriptive statistics. Frequency analysis is conducted to describe the individual characteristics of the recruiters, including RSTB scores and biodemographic attributes. One of the purposes of this research is to either support or discount previous validation studies of the RSTB. To make comparisons, then, cross tabulations between production and

RSTB scores are developed. The RSTB scores are separated into quintiles. Production is divided into the upper 50th and lower 50th percentiles. Additionally, cross tabulations are conducted with RSTB scores also separated into the upper 50th and lower 50th percentiles.

Bivariate Pearson product-moment correlations are computed for further comparison of each factor. Multivariate regression analysis is also used to determine the impact of the RSTB scores, combined with the biodemographic variables, on productivity and success. The reasoning behind this is that modelling recruiter success seems to be a natural progression from techniques previously described, especially with the data already collected. If this leads to meaningful results, then the knowledge base (which appears to be limited) to describe recruiter behavior is expanded.

For production as a continuous variable, estimation is accomplished using Ordinary Least Squares (OLS) estimating techniques. When success, as generated from production, becomes a binary variable, the logistic regression procedure is utilized.

The logistic procedure employs the maximum likelihood estimating technique which is more suited to the distributions expected from using a dichotomous dependent variable. Two models are examined using each technique. One model includes the recruiter composite percentile score on the RSTB, with the biodemographic variables chosen to

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explain success/productivity. The other model utilizes the four raw subscale scores. A sample description and all statistical results are presented and discussed in greater detail in Chapter IV.

# IV. ANALYSIS AND RESULTS

## A. SAMPLE DESCRIPTION

Frequency analysis is used to describe the characteristics of the 236 recruiters in this sample. Table 3 displays the biodemographic attributes of the sample. As could be expected, the majority of the sample has some type of high school diploma, since the Navy prefers to recruit individuals with that credential. Another interesting aspect of this sample is the large number of married individuals with two or more children. In addition, the average age of the recruiters is 31 years old. The recruiters appear to be distributed among the six different recruiting regions fairly evenly.

Table 4 provides a description of these recruiters' human relations skills, selling skills, organizing skills, overall performance, and recruiter potential composite percentile (RECPCNT) scores on the RSTB. The RSTB subscale scores used in this thesis are raw scores generated from the scoring machine at Headquarters, Marine Corps. Negative scores are possible because points are taken away in the scoring for certain types of answers on questions of the RSTB. The recruiters' scores are separated into quintiles. These quintiles are used for much of the following analyses. The recuiters' RSTB scores appear to closely fit the shape of a normal distribution.

# TABLE 3

## BIODEMOGRAPHIC CHARACTERISTICS OF RECRUITERS

| Characteristic | Frequency | Percent of Sample |
|---|---|---|
| Upper AFQT Category | 177 | 75 |
| Lower AFQT Category | 59 | 25 |
| | | |
| Age: | | |
| 22-25 | 56 | 24 |
| 26-30 | 65 | 27.5 |
| 31-35 | 65 | 27.5 |
| 36-40 | 36 | 15 |
| 41-48 | 14 | 6 |
| | | |
| Marital/Dependents Status: | | |
| Single | 22 | 9 |
| Single with dep. | 12 | 5 |
| Married | 47 | 20 |
| Married with 1 child | 42 | 18 |
| Married with 2 or more children | 113 | 48 |
| | | |
| High School Graduate | 218 | 92 |
| Non-High School Grad. | 18 | 8 |
| | | |
| White | 197 | 83 |
| Minority | 39 | 17 |
| | | |
| MCS: | | |
| Navy Counselor | 16 | 7 |
| Administrative | 19 | 8 |
| Specialist | 48 | 20 |
| Repairer | 153 | 65 |
| | | |
| Recruiting Area: | | |
| Area1 | 57 | 24 |
| Area3 | 24 | 10 |
| Area4 | 45 | 19 |
| Area5 | 51 | 22 |
| Area7 | 32 | 14 |
| Area8 | 27 | 11 |

# TABLE 4

## RECRUITERS' PERFORMANCE ON RSTB AND PRODUCTION IN THE FIELD

| | Range | Frequency | Percent of Sample | Mean | Standard Deviation |
|---|---|---|---|---|---|
| **RSTB Scores:** | | | | | |
| Human Relations Skills (HRRAW): | | | | 18.04 | 6.99 |
| | -1- 7 | 17 | 7 | | |
| | 8-14 | 54 | 23 | | |
| | 15-21 | 92 | 39 | | |
| | 22-28 | 54 | 23 | | |
| | 29-35 | 19 | 8 | | |
| Selling Skills (SSRAW): | | | | 15.07 | 6.87 |
| | -4- 3 | 15 | 6 | | |
| | 4-10 | 41 | 17 | | |
| | 11-17 | 92 | 39 | | |
| | 18-25 | 72 | 31 | | |
| | 26-33 | 16 | 7 | | |
| Organizing Skills (OSRAW): | | | | 16.23 | 5.98 |
| | -1- 4 | 4 | 2 | | |
| | 5-10 | 36 | 15 | | |
| | 11-17 | 104 | 44 | | |
| | 18-24 | 66 | 28 | | |
| | 25-31 | 26 | 11 | | |
| Overall Performance (OPRAW): | | | | 18.26 | 7.40 |
| | -4- 4 | 8 | 3 | | |
| | 5-12 | 46 | 20 | | |
| | 13-20 | 86 | 36 | | |
| | 21-28 | 70 | 30 | | |
| | 29-36 | 26 | 11 | | |

TABLE 4 (cont.)

RECRUITERS' PERFORMANCE ON RSTB AND PRODUCTION IN THE FIELD

| | Range | Frequency | Percent of Sample | Mean | Standard Deviation |
|---|---|---|---|---|---|
| Composite Recruiter Potential Score Percentiles (RECPCNT): | | | | 56.56 | 16.63 |
| | 13-27 | 10 | 4 | | |
| | 28-43 | 38 | 16 | | |
| | 44-59 | 83 | 35 | | |
| | 60-75 | 77 | 33 | | |
| | 76-91 | 28 | 12 | | |
| Average Yearly Production Rates: | | | | 18.90 | .50 |
| | 1.0 - 9 | 57 | 24 | | |
| | 9.33-19 | 61 | 26 | | |
| | 19.33-29 | 77 | 33 | | |
| | 29.33-39 | 34 | 14 | | |
| | 39.67-48.33 | 7 | 3 | | |
| Number (Percent) Successful for Production >= 18/20: | | 115 | 49% | | |
| Number (Percent) Not Successful at Production >= 18/20: | | 121 | 51% | | |
| Number (Percent) Successful for Production >= 30: | | 39 | 17% | | |
| Number (Percent) Not Successful at Production >= 30: | | 197 | 83% | | |

Table 4 also shows a breakdown of the productivity of the recruiters in the sample and their corresponding levels of success. Success at the lower level of production is defined as the recruiter having at least 18 new contracts per year, if he or she was productive only in fiscal 1983 and 1984. If the recruiter was productive during fiscal 1983, 1984, and 1985 then he or she is considered successful when productivity is 20 or more contracts per year.

## B. CROSS TABULATION ANALYSIS

Cross tabulations provide information concerning the recruiters' performance on recruiting duty relative to their performance on the RSTB. Figure 4.1 shows these results. This figure indicates, for example, that 63 percent of the recruiters scoring in the upper 20th percentile of the selling skills subscale were successful, compared to 53 percent of those scoring in the lowest 20th percentile. Success in this instance is defined as recruiters with production rates in the upper half of all production.

A comparison between the results of this cross tabulation and the results presented by the Borman et al. validation study of 1981 reveals that Borman et al. expected individuals who scored poorly on the subscales of the RSTB to also have less success on recruiting duty [Ref. 3]. Figure 4.1 suggests that this expectation does not carry over to this sample of recruiters. Those individuals who scored in the top, middle, and lowest levels on the

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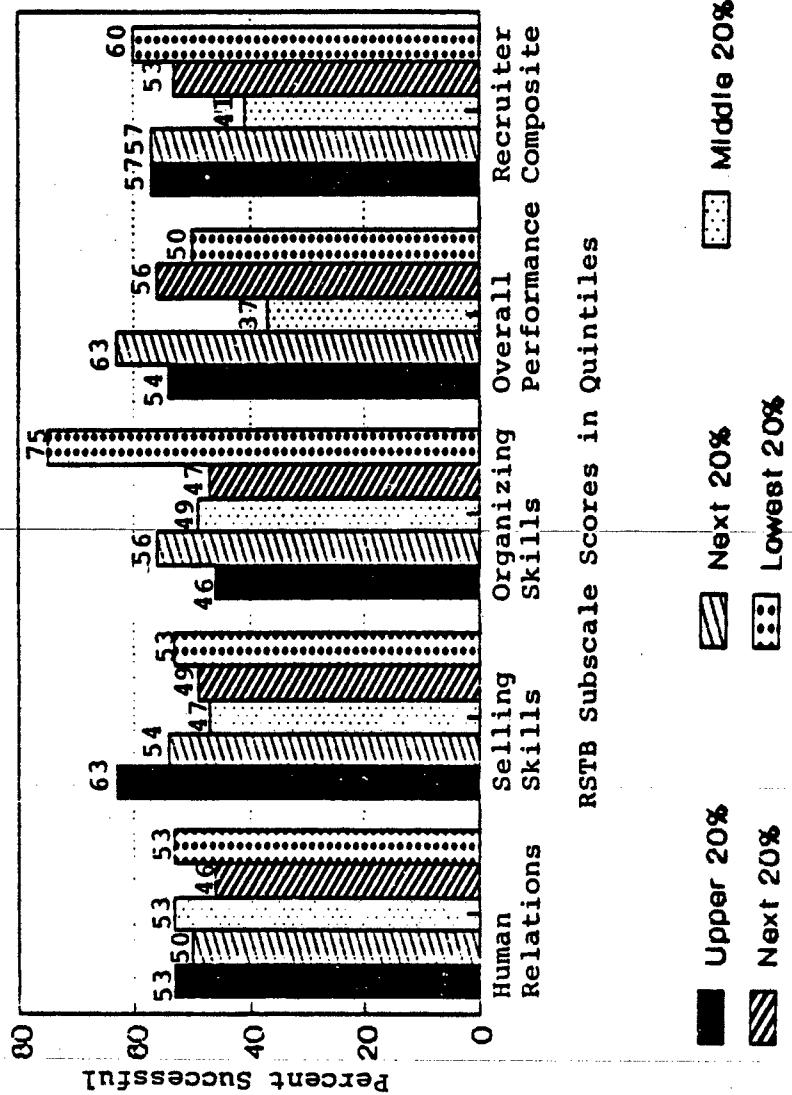
Figure 4.1 - Percent Successful Recruiters
(Where Upper 50 Percent is Considered Successful)

human relations skills had equal instances of success. Within the selling skills subscale, recruiters scoring in the highest quintile had the most success; however, those scoring in the lowest 20th percentile performed better than did those in the next two higher quintiles.

Individuals who scored in the top level of organizing skills had the lowest occurrences of success of all recruiters in the sample. Conversely, those who scored in the lowest quintile had the highest level of success. This result, in particular, is in direct contrast to what was predicted in the 1981 validation. However, this result may be attributable to sample effects. As shown in Table 4, only four people in the sample scored in the lowest quintile on selling skills. Because of this, the cross tabulation between the lowest performers on selling skills and productivity may not be representative and, therefore, may be misleading.

Overall performance and RECPCNT scores also have fairly eratic associations with success. Overall performance is the only subscale where recruiters scoring in the lowest quintile have the least occurrence of success. However, the opposite cannot be said of those scoring in the highest quintile of this RSTB subscale. One consistency to be seen from Figure 4.1 is that in three of the five subscales, the middle scoring group of recruiters had the lowest oc-currences of success. In the two other categories of

performance on the RSTB, the middle group's success rate is in the middle.

Cross tabulations between recruiters' RSTB scores separated into upper and lower 50th percentiles and recruiters' productivity separated into upper and lower 50th percentiles reveal a pattern that is somewhat more consistent with previous validation studies. Figure 4.2 shows, that, for example, of those recruiters who scored in the upper 50th percentile on the overall performance subscale, 57 percent were in the upper 50th percentile on production. Only 43 percent of those scoring in the lower half of the overall performance category were successful.

Chi-square tests of homogeneity or independence between the levels of success show that only the difference between the upper and lower scores on the overall performance subscale is statistically significant at .05. All other differences in performance on the RSTB are insignificant at levels of .30 or more. Thus, even though there are differences between the recruiters' productivity in relation to how they score on the RSTB subscales, the majority of these differences mean very little.

Another way to examine these recruiters' performance on the RSTB relative to their production is to look at average levels of productivity. Figure 4.3 presents these results, which are useful for comparison to the United States Marine Corps (USMC) validation of 1986. [Ref. 4] The results from that study led the researchers to conclude that "Marines

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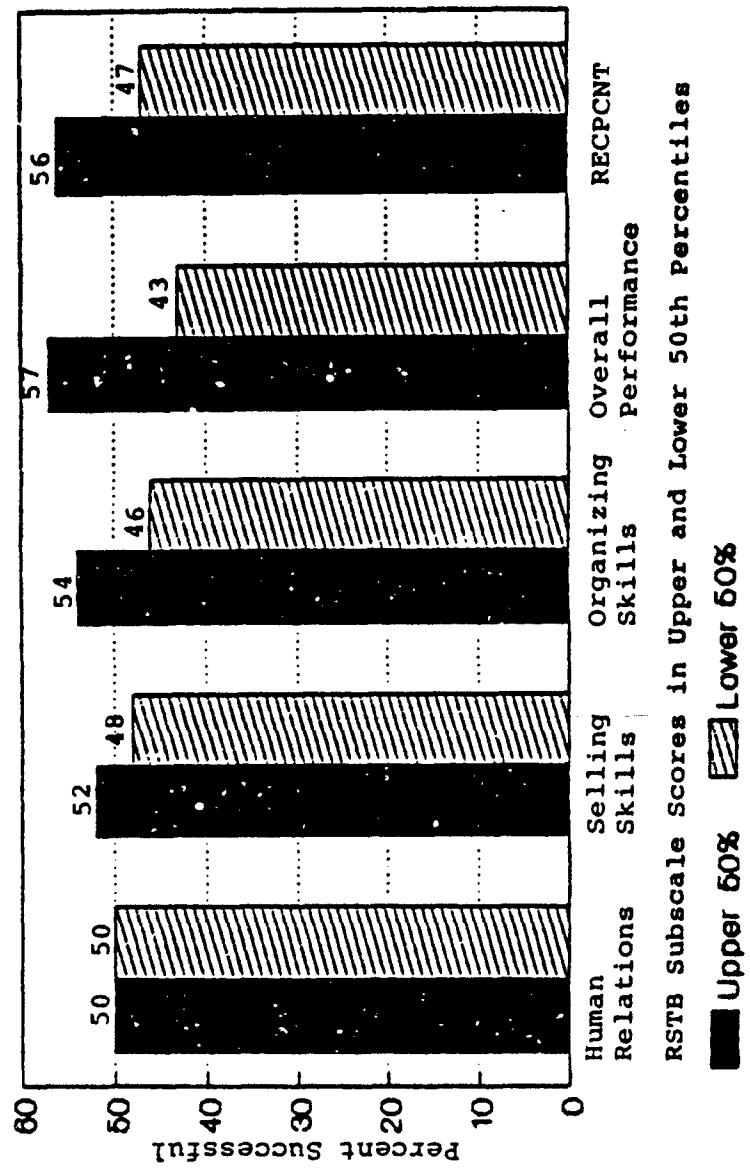
Figure 4.2 - Percent Successful Recruiters
(Where Upper 50 Percent is Considered Successful)

54
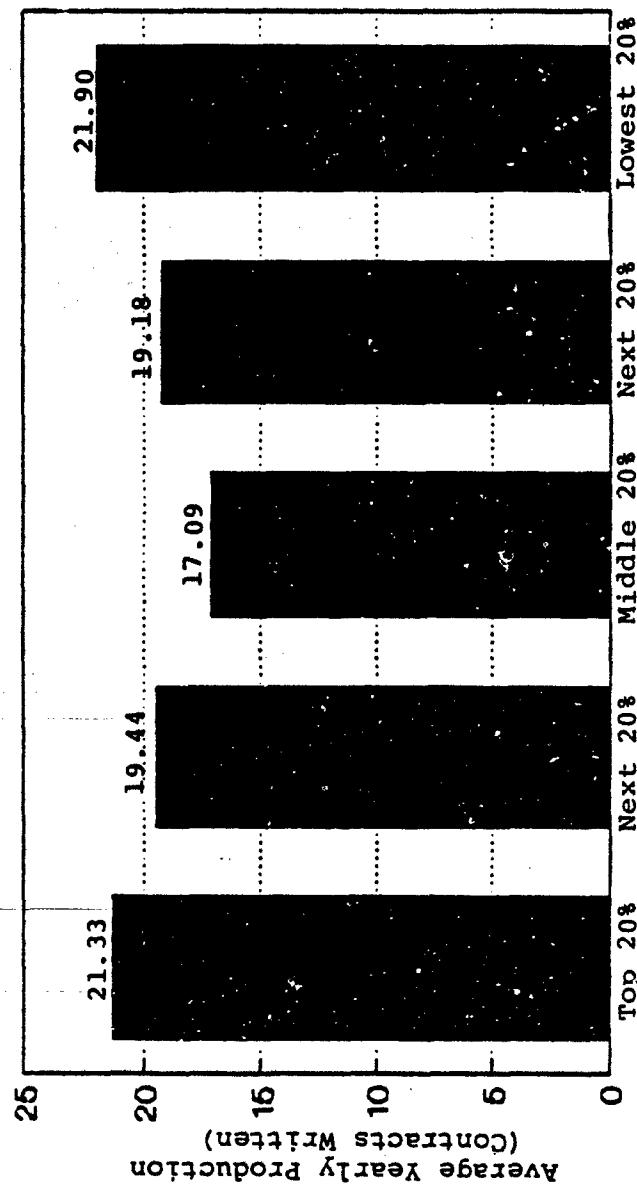
Figure 4.3 - Recruiter Potential Composite (RECPCNT) Scores and Average Yearly Productivity

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whose Special Assignment Battery (the RSTB equivalent) scores fell in the lowest 20 percent consistently performed at significantly lower levels that higher scoring sub- jects."

Figure 4.3 shows that recruiters whose RECPCNT score was in the upper 20 percent had levels of productivity that were higher than the recruiters scoring in the next two lower quintiles. However, recruiters scoring in the lowest quintile of the RECPCNT scores had the highest average yearly productivity of any group.

## C.  CORRELATION ANALYSIS

Further examination of the relationships between RSTB scores of this sample and average yearly production rates using Pearson product-moment correlations is presented in Table 5.  Also presented here are the correlation results reported in the development validation study of 1981 and the two USMC validations published in 1986 [Ref. 3 and Ref. 4].

The correlations from this current research are very different from those of the previous studies.  In fact, the most highly correlated subscale with production is the selling skills score of the recruiters at the level of .087.   This is also the score with the highest level of significance.   However, a significance level of .18 does not  indicate a very strong relationship. Negative cor- relations between production and the human relations and organizing skills indicate that as these scores increase,

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# TABLE 5

## COMPARISON OF CORRELATIONS BETWEEN PRODUCTION[a]
## AND RSTB SCORES

| Predictor (Skill) | RSTB Validation Study 1989 (n=236) | Development Study 1981 (n=194) | USMC Concurrent Study 1986 (n=1005) | USMC Predictive Study 1986 (n=315) |
|---|---|---|---|---|
| Human Relations | -.013 | .23 | .15 | .15 |
| Level of Sig. | p = .84 | p < .01 | p < .05 | p < .01 |
| Selling | .087 | .22 | .23 | .23 |
| Level of Sig. | p = .18 | p < .01 | p < .001 | p < .01 |
| Organizing | -.002 | .13 | .09 | .09 |
| Level of Sig. | p = .98 | NA | p < .05 | NA |
| Overall Perform. | .038 | .26 | .24 | .24 |
| Level of Sig. | p = .55 | p < .01 | p < .001 | p < .01 |
| Recruiter Composite | .038 | .27 | .22 | .22 |
| Level of Sig. | p = .56 | p < .01 | p < .001 | p < .01 |

[a]Production in 1989 Validation = Average Yearly Contracts
Production in 1981 and 1986 Validations = Average Monthly
Contracts

NA = Not Available

productivity falls. However, the levels of significance on
these two results show that they cannot be relied on for
accuracy.

Additional correlation analysis was conducted using the
biodemographic variables provided for these recruiters.
The purpose of this analysis is to compare the relationship
of the biodemographic variables with productivity against
the relationship of the RSTB scores with productivity.
This may provide further insight into recruiter pro-
ductivity and success. It may also reveal whether or not
biodemographic variables can be used to select recruiters
who will succeed in conjunction with or in place of RSTB
scores. Table 6 shows the results of this correlation
analysis.

Not surprisingly, AFQT score of the individual has the
strongest and most significant correlation with pro-
ductivity. What is surprising is that the correlation is
negative--the reverse of what was expected. There may be
two explanations for this. First, a cross tabulation
between the AFQT upper and lower 50th percentiles and
productivity, as shown in Table 7, reveals that more
recruiters (by percentage) with below average AFQT scores
had production rates in the upper 50th percentile than
those with above average AFQT scores. Therefore, the
negative relationship is expected, given the sample data.

# TABLE 6

## PEARSON CORRELATION COEFFICIENTS BETWEEN BIODEMOGRAPHIC VARIABLES AND AVERAGE YEARLY PRODUCTION OF THE RECRUITERS

| Variable | Correlation Coefficient | Level of Significance |
|----------|------------------------|----------------------|
| AFQT | -.233[a] | .001 |
| AGE | -.076 | .25 |
| SINGLE | .040 | .54 |
| MARRIED | -.009 | .89 |
| MAR1KID | -.099 | .13 |
| MAR2KID | .060 | .36 |
| HS | -.026 | .69 |
| WHITE | -.146[a] | .02 |
| MOS1 | .175[a] | .007 |
| MOS2 | -.015 | .82 |
| MOS3 | -.013 | .85 |
| AREA1 | -.130[a] | .J5 |
| AREA3 | -.008 | .89 |
| AREA4 | .044 | .50 |
| AREA5 | .021 | .75 |
| AREA8 | .185[a] | .004 |

[a] Indicates significance at .10 level or better.

## TABLE 7

PERCENT OF RECRUITERS WITH ABOVE AND BELOW AVERAGE
PRODUCTION LEVELS BY AFQT PERCENTILE SCORES
(ABOVE OR BELOW 50TH PERCENTILE)

| AFQT Score | Production | |
| | Lower 50 Percent | Upper 50 Percent |
| --- | --- | --- |
| Below 50th Percentile | 32.20 | 67.80 |
| Above 50th Percentile | 54.80 | 45.20 |

A deeper explanation for this negative relationship may stem from a policy change enacted around June 1983. [Ref. 28] According to Navy Recruiting Command, in mid-1983, Congress mandated a cut in end-strength of the Navy's enlisted force. To accomplish this, accession goals were cut dramatically. Therefore, those recruiting districts that had either met or were approaching the reduced goals either stopped recruiting altogether or proceeded to build up membership in the Delayed Entry Program (DEP). It is speculated that in these districts, those (high AFQT) recruiters who had met their individual recruiting goals slacked off, either intentionally or unitentionally. This allowed those (low AFQT) recruiters who may have had difficulty meeting goals during highly competitive periods to attain their recruiting goals as well. The effects of this may have carried over as far as mid-1984 because of the built-up DEP, the decreased pressure of competition within individual recruiting commands, and the continuing relatively high levels of unemployment. This would have

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artificially inflated the recruiters' production rates within this sample.

Other significant results from this correlation analysis are the negative relationships between white recruiters and production and between AREA1 and production. This AREA1 result is also somewhat unexpected. The area variables were constructed so that the area with the lowest averages in recruiting productivity during fiscal 1983, 1984, and 1985 was the base case variable (AREA7). Therefore, all other areas were expected to have positive relationships with production rates. The basis for this was provided in the PRIDE data from the Center for Naval Analyses. Table 8 presents the production and unemployment rates for each area, by fiscal year. The consistently low unemployment rates in AREA1 coupled with the dramatic drop in average production in fiscal 1985 may account for the negative correlation between AREA1 and productivity.

As anticipated, MOS1 (Navy Counselors) is positively and significantly related to productivity. Marital status has little or no relationship with production rates. One interesting result to note is the positive (although, insignificant) relationship between individuals with two or more children and productivity. Perhaps, if this group were further separated into categories of recruiters with two children, recruiters with three children, and so on, the correlation would be more meaningful. As it is now, this positive relationship indicates that the hypothesized

# TABLE 8

## PRODUCTION AND UNEMPLOYMENT RATES FOR EACH RECRUITING AREA BY FISCAL YEAR

|  | AREA1 | AREA3 | AREA4 | AREA5 | AREA7 | AREA8 |
|---|---|---|---|---|---|---|
| **Fiscal 1983:** | | | | | | |
| Total Contracts | 12,275 | 11,480 | 11,827 | 12,168 | 9,723 | 10,813 |
| Number of Recruiters | 665 | 651 | 590 | 662 | 559 | 583 |
| Average Production | 18.46 | 17.63 | 20.05 | 18.38 | 17.39 | 18.55 |
| Unemployment[a] | 8.48 | 9.84 | 12.17 | 10.52 | 9.35 | 10.50 |
| **Fiscal 1984:** | | | | | | |
| Total Contracts | 10,921 | 10,913 | 11,215 | 11,159 | 8,677 | 10,477 |
| Number of Recruiters | 583 | 618 | 548 | 590 | 511 | 541 |
| Average Production | 18.73 | 17.66 | 20.47 | 18.91 | 16.98 | 19.37 |
| Unemployment[a] | 6.57 | 7.34 | 9.70 | 8.01 | 7.47 | 8.06 |
| **Fiscal 1985:** | | | | | | |
| Total Contracts | 10,178 | 11,571 | 10,749 | 11,953 | 9,780 | 11,286 |
| Number of Recruiters | 607 | 642 | 558 | 622 | 533 | 592 |
| Average Production | 16.77 | 18.02 | 19.26 | 19.22 | 18.35 | 19.06 |
| Unemployment[a] | 5.77 | 6.81 | 8.60 | 7.58 | 7.65 | 7.50 |

[a] Average Unemployment per Area =

$$\frac{\text{Sum(Unemployment for Navy Recruit. Districts (NRD) in Area)}}{\text{Number of NRDs in Area}}$$

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increased family-related stress plays no part in a recruiters' level of productivity.

Correlations between the variables, excluding production rates, reveal three more relationships that are worthy of note. First, white recruiters and recruiters scoring in the upper 50th percentile on the AFQT have a correlation of .56 (p < .001). Second, each of the RSTB subscales are intercorrelated. These correlations range from .38 between selling and organizing skills to .80 between selling skills and overall performance. All of the relationships are significant at p < .001. This is actually a good sign from one perspective--recruiters who perform well on one aspect of the test battery also perform well on other portions, and vice versa.

Finally, the marital/dependents status variables are all correlated at levels ranging from .23 to .48 (p < .001). This is to be expected, given the way these variables were constructed. These correlations, between potential explanatory variables, may create some difficulties when interpreting effects of the variables on productivity/success on recruiting duty in the following multivariate models.

## D. MULTIVARIATE REGRESSION ANALYSIS

### 1. Ordinary Least Squares (OLS) Regressions

The first two models discussed in this section are estimated using the method of OLS regression. The dependent variable is the recruiters' average yearly number of

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contracts (production rates).    These models assume linear
relationships between the continuous dependent variable and
the explanatory variables.    Table 9  shows the estimation
results of Model 1.    This  model  contains  the recruiter
potential  composite  percentile  score  as  one of the ex-
planatory variables.  Model 2, in  contrast, uses  the RSTB
subscale scores.

In these constant slope models, elasticities can be
computed for the continuous variables.    Each elasticity is
calculated using  the mean  values of  both the explanatory
variables and the production  rate.    The interpretation of
the elasticities  of the continuous variables in Model 1 is
as follows:

a.  For every one percent rise in an individual's
    RECPCNT score, the production  rate is  expected to
    increase .006 percent.

b.  For every one percent increase in an individual's
    AGE, there will be a resulting .38 percent decrease
    in productivity.

The estimated model  shows  that  first,  there are
only  four  variables  in  it  that  have  a  statistically
significant  impact  on  recruiter  productivity.    If  an
individual scores in the upper 50th percentile on the AFQT,
there is a significant,  but negative  effect on production
rates.  A one year increase in a recruiter's AGE leads to a
.23 decrease in average production per year.    Being a Navy
Counselor (MOS1)  indicates that productivity will increase
by 7.26 average contracts per year.  Finally, recruiting in

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## TABLE 9

### OLS REGRESSION MODEL 1
### (DEPENDENT VARIABLE = AVERAGE YEARLY CONTRACTS WRITTEN)

| Variable | Coefficient | /T-Statistic/ | P |
|----------|-------------|---------------|-----|
| RECPCNT | .002 | .06 | .95 |
| AFQT | -4.71[a] | 2.54 | .01 |
| AGE | - .23[a] | 1.79 | .07 |
| SINGLE | .88 | .24 | .91 |
| MARRIED | - .46 | .14 | .89 |
| MAR1KID | -1.48 | .45 | .65 |
| MAR2KID | .53 | .17 | .86 |
| HS | - .82 | .24 | .81 |
| WHITE | -1.01 | .45 | .65 |
| MOS1 | 7.26[a] | 2.66 | .01 |
| MOS2 | 1.60 | .63 | .53 |
| AREA1 | - .26 | .15 | .88 |
| AREA3 | -1.06 | .46 | .64 |
| AREA4 | 1.23 | .45 | .65 |
| AREA5 | 1.80 | .75 | .46 |
| AREA8 | 6.27[a] | 2.36 | .02 |

[a] Significant at $p < .10$

Adjusted $R^2$ = .08
F-Statistic = 2.22   Prob. = .005
Number of Observations = 236
Mean Square Error = 97.04

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AREA8 leads to the greatest influence on average yearly production.

Although RECPCNT scores are not significant in this model, they have a small positive effect on recruiter productivity. Marital status results are primarily as expected. Being single leads to a positive effect on productivity and being married with one child influences recruiter production rates more negatively than does simply being married. The surprising result is that being married with two or more children apparently does not affect productivity negatively. This result is consistent with the correlation analysis results. The MAR2KID variable coefficient is not significant, so this result may be entirely misleading. Being white and a high school graduate both have negative impacts on recruiter productivity, but again, these are not significant results. High school graduation may have little bearing on production rates in this thesis because recruiters who have been selected for recruiting duty and to the pay grade of at least E-5 probably have attained some equivalency of the high school diploma. By this time in the recruiter's career, whether or not the individual completed high school may be irrelevant.

As expected, the coefficient for the strictly administrative occupational specialties (MOS2) is positive and the specialist's (MOS3) coefficient is negative. Finally, as was seen in the correlation analysis, re-

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cruiting in AREA1 has a negative influence on production rates, while all other areas have positive effects. Unfortunately, the majority of these results are insignificant.

Recruiter characteristics which have significant effects on productivity in Model 1 are AFQT score, the Navy Counselor occupation (MOS1), and recruiting in AREA8. The negative impact of scoring above average on the AFQT is, again, interesting. The explanation for this may be described as the artificial inflation of recruiter productivity, which was discussed above. Another reason that being in the upper 50th percentile of the AFQT scores has a negative impact may be that individuals who score high on the AFQT may be better suited for other work--they simply may not make good recruiters.

Based on the production and unemployment rates shown in Table 8, it was anticipated that recruiting in AREA4 would have the greatest impact on recruiter productivity. This is not the case; however, AREA4 does have the second largest effect. The explanation for this is unclear.

Table 10 presents the results for the second multivariate regression model using the average yearly contracts obtained by the recruiters (production rates) as the continuous dependent variable. Substituting the RSTB subscale scores for the recruiter potential composite score does little to improve Model 2. The adjusted $R^2$ for both

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## TABLE 10

### OLS REGRESSION MODEL 2
### (DEPENDENT VARIABLE = AVERAGE YEARLY CONTRACTS WRITTEN)

| Variable | Coefficient | /T-Statistic/ | P |
|---|---|---|---|
| HRRAW | − .18 | 1.20 | .23 |
| SSRAW | .16 | .93 | .35 |
| OSRAW | .11 | .71 | .48 |
| OPRAW | − .05 | .25 | .81 |
| AFQT | − 4.45[a] | 2.36 | .02 |
| AGE | − .26[a] | 1.93 | .05 |
| SINGLE | 1.10 | .30 | .76 |
| MARRIED | .14 | .04 | .97 |
| MAR1KID | − 1.29 | .38 | .70 |
| MAR2KID | .79 | .25 | .80 |
| HS | − 1.13 | .44 | .66 |
| WHITE | − 1.33 | .60 | .55 |
| MOS1 | 7.20[a] | 2.62 | .01 |
| MOS2 | 1.96 | .76 | .45 |
| MOS3 | − .17 | .10 | .92 |
| AREA1 | − .69 | .29 | .77 |
| AREA3 | 1.29 | .47 | .64 |
| AREA4 | 2.13 | .88 | .38 |
| AREA5 | 1.64 | .67 | .50 |
| AREA8 | 6.79[a] | 2.54 | .01 |

[a] Significant at $p < .10$

Adjusted $R^2$ = .08
F-Statistic = 2.00 Prob. = .008
Number of Observations = 236
Mean Square Error = 97.22

models are identical and the low value (.08) suggests that the amount of variation in productivity explained by the models' variables is minimal--the models do not predict productivity very well.

The same explanatory variables are significant in both models and each variables' relative impact remains the same, with one minor exception. The variable constructed for married recruiters has gone from being negative in Model 1 to having a positive sign in Model 2. However, it remains insignificant in Model 2, suggesting no real influence on production rates.

Elasticities of the RSTB subscale variables, computed at their mean values, suggest the following:

a. For every one percent increase in the human relations skills score, there is a resulting .17 percent decrease in productivity.

b. For every one percent rise in the selling skills score, production rates increase .13 percent.

c. A one percent increase in the organizing skills score indicates a .09 percent increase in productivity.

d. For every one percent increase in the overall performance score, productivity decreases approximately .05 percent.

The negative impacts of the HRRAW and OPRAW variables are insignificant, and yet, unexpected. Model 2 predicts that if recruiters score low on these subscales of the RSTB, their productivity will be higher than those who score well. This is totally inconsistent with the hypo-

thesis that the RSTB can be used to predict recruiter success.

### 2. Logistic Regressions

There are four models presented in this section using the logistic regression method of estimating coefficients. The four models are organized in such a way as to allow for comparisons between the two levels of success as the dependent variable and like explanatory variables. Success is defined as a binary variable. Success equals one when a recruiter produced 18 contracts per year, if he or she was on recruiting duty only in fiscal 1983 and 1984. If the recruiter remained on recruiting duty from fiscal 1983 to 1985, then he or she is considered successful if 20 or more contracts per year were obtained. The logistic regression, using the maximum likelihood method to estimate the coefficients, is particularly useful in this analysis because success is a dichotomous variable that describes behavior on a micro level. [Ref. 29] This method of regression suggests that the expected outcome of the logit model--probability of success--can be represented by the following equation:

$$P = 1/1 + e^{-(Sum(BiXi))}$$

where:  $P$ = Probability of Success
$e$ = Natural Log
$Sum(BiXi)$ = Sum of the estimated coefficients from the models multiplied by assumed values of the explanatory variables.

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Table 11 provides estimation results of Model 3 and Model 4.

In Model 3 of the logistic regression, three variables were found to have a significant impact on success. Again, scoring in the upper 50th percentile on the AFQT has a negative effect on success, as does AGE. Also, the Navy Counselor MOS contributes positively to the prediction of success. In fact, in comparing results between Models 3 and 4 with their varying levels of success, the Navy Counselor variable impact is the only consistent result. AREA8 has a significant, positive effect in Model 4. All other variables in this second model have insignificant results.

Interestingly, RECPCNT acquires a negative sign when success is defined more stringently. However, recruiting in AREA1 changes to a positive influence on success. Other reversals in coefficient signs, as a result of the change in the criteria for success, indicate that being single, being married, or being married with two or more children all have negative effects in Model 4. High school graduation no longer has a positive impact in Model 4. Finally, the repairers now have the lowest impact on success, contrasted with the specialists (MOS3) of the previous models.

To evaluate the specific impact of each variable on these models, partial effects are computed. With the logistic regression, these effects are interpreted as

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## TABLE 11

### LOGISTIC REGRESSION RESULTS FOR MODEL 3 AND MODEL 4

| Variable | Model 3 Success = Production > = 18 or 20 Contracts[a] | | | Model 4 Success = Production > = 30 Contracts | | |
|---|---|---|---|---|---|---|
| | Coef. | CHI$^2$ | P | Coef. | CHI$^2$ | P |
| RECPCNT | .001 | .03 | .86 | - .009 | .61 | .44 |
| AFQT | - .92[b] | 5.22 | .02 | - .72 | 1.96 | .16 |
| AGE | - .05[b] | 3.22 | .07 | - .04 | 1.24 | .26 |
| SINGLE | .24 | .10 | .75 | - .47 | .24 | .63 |
| MARRIED | .18 | .07 | .80 | - .87 | 1.03 | .31 |
| MAR1KID | - .47 | .46 | .50 | - .69 | .62 | .43 |
| MAR2KID | .20 | .10 | .76 | - .68 | .73 | .39 |
| HS | .46 | .71 | .40 | - .72 | 1.14 | .28 |
| WHITE | - .26 | .29 | .59 | - .04 | 0 | .95 |
| MOS1 | 1.26[b] | 3.75 | .05 | 1.32[b] | 3.86 | .05 |
| MOS2 | .10 | .03 | .86 | .75 | .99 | .32 |
| MOS3 | - .48 | 1.63 | .20 | .35 | .50 | .48 |
| AREA1 | - .09 | .03 | .85 | - .64 | .57 | .45 |
| AREA3 | .08 | .02 | .89 | .89 | 1.14 | .28 |
| AREA4 | .44 | .73 | .39 | .83 | 1.25 | .26 |
| AREA5 | .22 | .19 | .67 | .19 | .06 | .81 |
| AREA8 | .70 | 1.46 | .23 | 1.64[b] | 4.65 | .03 |

[a] Contracts expected per year of recruiters on recruiting duty for fiscal 1983 and 1984 = 18. Contracts expected per year of recruiters on recruiting duty through fiscal 1985 = 20.

[b] Significant at .10 level or better.

TABLE 11 (cont.)

## LOGISTIC REGRESSION RESULTS FOR MODEL 3 AND MODEL 4

Classification Table of
Model 3 Predictive
Ability

Classification Table of
Model 4 Predictive
Ability

| | | Predicted | | | | | Predicted | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Neg. | Pos. | Total | | | Neg. | Pos. | Total |
| | Neg. | 88 | 33 | 121 | | Neg. | 195 | 2 | 197 |
| True | | | | | | True | | | |
| | Pos. | 46 | 69 | 115 | | Pos. | 34 | 5 | 39 |
| Total | | 134 | 102 | 236 | | Total | 229 | 7 | 236 |

Overall Prediction Rate:
  66.5%

Overall Prediction Rate:
  84.7%

False Neg. Rate:  34.3%

False Neg. Rate:  14.8%

False Pos. Rate:  32.4%

False Pos. Rate:  28.6%

increases or decreases in the probability of success, given certain values for the variables being examined. In addition, the base case scenario for these models was constructed so that it consists of the recruiter characteristics that are expected to have the most negative impacts on success. Thus, the base case includes those recruiters scoring in the lower 50th percentile on the AFQT who are single with dependents, non-high school graduates, minorities, with a repairer-type MOS, recruiting in AREA7. Given the results of Model 3, the probability of success for the recruiter with base case characteristics, the average RECPCNT score, and the average age is 54 percent. This percentage is generated by inputing the estimated coefficients into the logit equation and solving for the probability of success.

Table 12 displays the independent partial effects for the variables having significant influences on success.

TABLE 12

PARTIAL EFFECTS OF AFQT, AGE, MOS1 ON SUCCESS IN MODEL 3

| Explanatory Variable | Calculated Probability of Success (Percent) |
|---|---|
| Above average AFQT score | 32 |
| Average AGE less one yr. | 57 |
| MOS1 (Navy Counselor) | 80 |

The base case scenario for Model 4 remains the same. Evaluation of the recruiters in the base case with the higher level of productivity determining success

reveals that they have a 39 percent probability of success. Navy Counselor (MOS1) recruiters in this model, compared to Model 3, have a slightly reduced probability of success at 71 percent. Finally, AREA8 recruiters with the same base case qualities have a likelihood of being successful of 77 percent.

The classification tables reveal that the correctly predicted rates of success are quite high. This suggests that, even though the level of significance on the individual explanatory variables is low, the overall models fit the data rather well.

Two additional logit models, providing results for the RSTB subscale scores as explanatory variables, are presented in Table 13. The dependent variables--"success"--are defined in the same manner as in Models 3 and 4.

Results in Model 5 are basically the same as those in Model 3. AFQT score and AGE negatively affect success, when success is defined as production rates greater than 18 or 20 contracts per year. The substitution of the RSTB subscale scores for the recruiter composite score does not improve the explanatory power of this model. None of the test scores have a statistically significant impact on success. As in the correlation analysis, human relations skills scores appear to have negative influences on success, while all other scores are positive.

An evaluation of this model with the RSTB scores set to their mean values, reveals that the probability of

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## TABLE 13

### LOGISTIC REGRESSION RESULTS FOR MODEL 5 AND MODEL 6

| Variable | Model 5 Success = Production > = 18 or 20 Contracts[a] | | | Model 6 Success = Production > = 30 Contracts | | |
|---|---|---|---|---|---|---|
| | Coef. | $CHI^2$ | P | Coef. | $CHI^2$ | P |
| HRRAW | − .02 | .41 | .52 | − .07[b] | 2.63 | .10 |
| SSRAW | .002 | 0 | .95 | .08 | 2.15 | .14 |
| OSRAW | .02 | .26 | .61 | .02 | .15 | .70 |
| OPRAW | .007 | .03 | .86 | − .04 | .45 | .50 |
| MARRIED | .19 | .08 | .78 | − .56 | .40 | .53 |
| MAR1KID | − .50 | .50 | .48 | − .49 | .29 | .59 |
| MAR2KID | .21 | .10 | .75 | − .58 | .50 | .48 |
| HS | .45 | .67 | .41 | − .88 | 1.59 | .21 |
| WHITE | − .29 | .36 | .55 | − .22 | .12 | .73 |
| MOS1 | 1.30[b] | 3.85 | .05 | 1.25[b] | 3.23 | .07 |
| MOS2 | .14 | .06 | .80 | .73 | .90 | .34 |
| MOS3 | .46 | 1.46 | .23 | .39 | .58 | .45 |
| AREA1 | − .10 | .04 | .84 | − .39 | .20 | .65 |
| AREA3 | .06 | .01 | .91 | .94 | 1.23 | .27 |
| AREA4 | .40 | .59 | .44 | .97 | 1.59 | .21 |
| AREA5 | .18 | .11 | .74 | .24 | .08 | .77 |
| AREA8 | .74 | 1.59 | .21 | 1.92[b] | 5.94 | .01 |

[a] Contracts expected per year of recruiters on recruiting duty for fiscal 1983 and 1984 = 18. Contracts expected per year of recruiters on recruiting duty through fiscal 1985 = 20.

[b] Significant at .10 level or better.

TABLE 13 (cont.)

## LOGISTIC REGRESSION RESULTS FOR MODEL 5 AND MODEL 6

Classification Table of                  Classification Table of
Model 5 Predictive                       Model 6 Predictive
Ability                                  Ability

|  | Predicted | | |  | Predicted | | |
|---|---|---|---|---|---|---|---|
|  | Neg. | Pos. | Total |  | Neg. | Pos. | Total |
| Neg. | 86 | 35 | 121 | Neg. | 193 | 4 | 197 |
| True | | | | True | | | |
| Pos. | 46 | 69 | 115 | Pos. | 32 | 7 | 39 |
| Total | 132 | 104 | 236 | Total | 225 | 11 | 236 |

Overall Prediction Rate:                 Overall Prediction Rate:
   65.7%                                    84.7%

False Neg. Rate:  34.8%                   False Neg. Rate:  14.2%

False Pos. Rate:  33.7%                   False Pos. Rate:  36.4%

success for recruiters with the base case attributes is 59 percent. Partial effects from the significant variables in this model are virtually identical to the Model 3 results, because of the similarity in the magnitude of the estimated coefficients of the explanatory variables.

An interesting outcome in Model 6, where the criteria for success is higher, is that human relations skills scores develop a significant influence on success; however, this relationship is negative. Selling skills scores are significant at the .14 level in this sixth model, which is more consistent with expected results. Again, as occurred between Models 3 and 4, AGE and AFQT score are no longer significant contributors to success at the higher level of productivity. The variable for Navy Counselors (MOS1) remains positive and significant. Recruiting in AREA8, once again, becomes significant and contributes the most to Model 6.

The degree of similarily between Models 3 and 5 and between Models 4 and 6 indicates that it does not matter whether the RSTB's composite recruiter potential score or the RSTB subscale scores are used. The effects of both test score results are negligible in the logistic regression models.

The changes observed from modifying the criteria for recruiter success do not necessarily represent an improvement of one model's predictive ability over the others. When the criteria for success are higher, the

occupational specialties influence success as expected. However, high school graduation has a negative effect on success, which was not anticipated. The variables SINGLE, MARRIED, and MAR2KID have a negative sign, whereas at the lower level of success they were positive. Each variable maintains its insignificant influence on success, so these changes mean virtually nothing.

### 3. General Comments

There are some general consistencies throughout all six models that deserve some attention here. First, scoring in the upper 50th percentile on the AFQT has a negative impact on production and success in all models. This result was not expected. However, the reduction of accession goals and the positive economic conditions for the recruiters in this sample certainly played some part in this outcome. Since it is also possible that this result truly indicates that lower scores on the AFQT may be related to success on recruiting duty, further assessment of this relationship could reveal implications for the recruiter selection process.

Second, older recruiters' potential for success, as indicated in each model, is lower than the potential for younger recruiters. It is possible that older recruiters (the Senior and Master Chiefs) are completing a "twilight" tour at a recruiting district in preparation for retirement. Thus, success on recruiting duty may not be a primary concern for these older recruiters. In addition,

senior recruiters are more likely to be the Leading Petty Officers or Supervisors of the recruiting office. These added duties may reduce their productivity, with respect to obtaining recruit contracts.

Third, being white, in every model, resulted in a negative impact on production or success. This outcome may be attributed to the limited variation in the sample with respect to this variable--only 39 recruiters (17 percent) were minorities. A second possibility is that if minority recruiters are more likely to be stationed in Navy Recruiting Districts with higher minority populations, their recruiting productivity may be enhanced.

The Navy Counselor MOS is consistently significant and the largest contributor, of all the MOSs, to production and success. This result was entirely expected. What wasn't expected was the negative effects of AREA1 and the large, positive impacts of recruiting in AREA8.

## V. CONCLUSIONS AND RECOMMENDATIONS

Recruiter losses from recruiting duty can cost the Navy substantial amounts of permanent change of station, temporary additional duty, and training dollars. Losses partially occur as a result of a recruiter's inability to consistently attain the enlistment contract goals imposed by Navy Recruiting Command. A lack of success at recruiting duty may affect a recruiter's outlook on the Navy and may result in lower morale and, possibly, a premature conclusion to his or her Navy career. These costs may be avoidable, to some extent, if a method could be divised to identify and select individuals who have a greater likelihood of success on recruiting duty.

Many methods of determining recruiter success have been extensively researched. The literature review section of this thesis examined a number of them. Some of the methods used in previous studies to evaluate the potential recruiter's ability to succeed at recruiting duty include expert systems, personal interviews, and testing procedures. Of interest to this thesis, in particular, are the conclusions reached as a result of research that used tests to predict recruiter performance.

The most recent test developed is the Recruiter Selection Test Battery (RSTB, also called the Special Assignment Battery by the Marine Corps). Two studies, one published in 1981 and one published in 1986, found that the

RSTB could be used to consistently predict a lack of success for those recruiters who scored in the lowest percentile on the exam [Ref. 3 and Ref. 4]. A recommendation of these studies was that the Navy should consider using the RSTB as an aid in selecting recruiters for recruiting duty.

This thesis investigates the feasibility of the recommendation to use the RSTB. This research attempted to answer the following questions:

a. Can the RSTB be used to predict recruiter success?

b. Are certain individual skill levels (RSTB subscales) more common among successful recruiters?

c. Are the results of this validation consistent with previous validation studies?

d. Finally, can readily available information on individual characteristics be used to predict recruiter success as well or better than the RSTB?

The answers to these questions are addressed below.

## A. CONCLUSIONS

Production data and biodemographic information were gathered on a sample of 236 recruiters who took the RSTB in 1982. The productivity of these recruiters was examined at two different levels to determine whether or not they were successful while on recruiting duty. Cross tabulations between RSTB scores and production rates showed that performance on the RSTB was not a consistent predictor of productivity in the field. Only those recruiters who scored in the highest percentile of the selling skills

subscale also performed "the best" in the field. However, the recruiters who scored in the lowest section of this subscale had success rates that were greater than the next two higher divisions. These results were inconsistent with the two previous validations of the RSTB.

Another cross tabulation, separating recruiters' productivity and RSTB scores into upper 50th percentiles and lower 50th percentiles, showed that, in every instance, individuals who scored in the upper 50th percentile had equal or better rates of success than those scoring in the lower 50th percentile. However, the test statistics revealed that the differences between the upper and lower scoring recruiters, in most cases, were insignificant. Therefore, it cannot necessarily be said that if one scores in the upper 50th percentile on the RSTB, his or her potential for success on recruiting duty is improved. Cross tabulations between average productivity and the RSTB recruiter potential composite score also confirmed this conclusion.

Correlation analysis provided the same type of inconclusive result. Again, the RSTB subscale with the most significant correlation with production rates was selling skills. However, this relationship appears to be tenuous, at best, with a coefficient of only .087 and a level of significance of $p = .18$. Negative relationships between the human relations and organizing skills serve to

underscore the difference between the results of this analysis and the results of prior correlation analyses.

Correlations between biodemographic characteristics and productivity were also examined. Biodemographics of the recruiters that were considered include Armed Forces Qualification Test (AFQT) scores, age, marital and dependents status, high school graduation, race-ethnicity, primary military occupational specialty (MOS), and the geographic locations of recruiting duty. The only variables that were significantly related to productivity, and that could sensibly and potentially be used to select personnel for recruiting duty, were race/ethnicity and MOS. Because AFQT scores were negatively related to productivity and this was unexpected, this author is hesitant to make any conclusions about selecting recruiters based on their lower AFQT scores.

The conclusion that could be drawn from these results would be to select only minorities and individuals with the Navy Counselor occupational specialty for recruiting duty. This, however, does not seem very realistic since personnel with these qualities are in relatively limited supply in the Navy. Thus, the conclusion to be reached at this juncture is that there is no real improvement in predicting the success of recruiters when using biodemographic information over using RSTB scores.

Multivariate regression analysis using both the RSTB scores and biodemographic variables to explain productivity

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and success results in much the same conclusion. Using Ordinary Least Squares as a method for estimating the effects of the variables on average yearly production rates produced a model with four significant variables (all biodemographic). However, these variables only explained .08 percent of the variation in recruiter productivity and only two of these variables could be used as screening criteria for potential recruiters. These are age, and again, the Navy Counselor occupational specialty.

It was speculated that older recruiters may be approaching the end of their Navy career and, therefore, do not possess as much motivation for succeeding as do younger personnel. Another explanation for the negative effects that age has on productivity may be attributable to the relationship that exists between age and pay grade. Senior recruiters are more likely to be the Leading Petty Officers or Supervisors of a recruiting office. Their administrative burdens may affect the number of enlistment contracts that they are required or able to obtain. Since there is no way to verify either of these hypotheses using the data collected for this thesis, policy implications regarding the age of persons selected for recruiting duty cannot be identified.

Finally, formal models of recruiter success were estimated using logistic regression. Success was defined using two different levels of productivity. Judging from the correct classifications of recruiters resulting from

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these models, one could speculate that these models were very effective at predicting recruiter success. In every model, however, there were only two or three statistically significant variables. The only variable, in each model, that has any meaning to the recruiter selection process is the Navy Counselor MOS. Therefore, the usefulness of either the OLS or logit models created for this research as aids to recruiter selection is very limited.

Overall, as a result of the analyses conducted, the answers to the questions posed at the start of this study are:

a. The RSTB cannot be used to predict recruiter success with any amount of certainty.

b. It appears that higher selling skills scores, as a subscale of the RSTB, may be more common among successful recruiters, but this relationship is somewhat tenuous.

c. The results of this validation show very little consistency with previous validations of the RSTB.

d. The only individual characteristic that has a possibility of being useful, at this time, as a screening aid for potential recruiters is the occupational specialty of Navy Counselor. The practicality of using this criteria is questionable.

## B. RECOMMENDATIONS

Despite inconclusive results concerning the RSTB as a predictor of recruiter success, two recommendations should be considered with respect to other aspects of this research. The number of losses for medical discharges and retirement from recruiting duty within this sample is

substantial (16 out of 236 recruiters). Therefore, it
should be emphasized to all Navy commands that correct and
accurate completion of the potential recruiter screening
form is essential. Because the form requires a
certification that the individual has no medical problems,
accurate completion of the screening form could eliminate
some of the losses from recruiting duty for medical
reasons.

Also, the only length-of-service criterion currently
being used to detail recruiters is that the individual be
in pay grade E-5 or above. A possible policy change that
may eliminate a large portion of the losses from recruiting
duty as a result of retirement would be to simply limit the
number of recruiters who are eligible for retirement. In
this sample, at least eight of the recruiters did not
complete a full three-year tour of recruiting duty because
they retired.

One consistent result throughout this research leads to
the recommendation that personnel who have served as a Navy
Counselor should be actively pursued to fill recruiting
duty billets. Again, the feasibility of this, due to the
relatively small number of individuals who meet this
qualification, may be limited.

Due to time constraints, there are several areas that
were not investigated using the data collected for this
thesis that may be worthwhile to examine in future
research. First, it is recommended that this sample of

recruiters' responses on the biographical portion of the RSTB be explored, in detail, for alternative variable definitions that may be useful in predicting recruiter success. Second, the productivity data available from the PRIDE system provide not only a raw count of recruit contracts obtained by a recruiter, but also information concerning the "quality" of the recruit. Using these data will supply added criteria for judging recruiter success, and provide a more accurate picture of the recruiter's success.

It may be beneficial, because of the limitations encountered in using the PRIDE productivity data, to also search for alternative measures of success for use with the RSTB scores obtained for this thesis. These measures could include performance data, such as supervisor or peer ratings, or performance evaluations. Another option is to locate a source, other than Navy Recruiting Command, that has maintained Freeman Transfer information on this group of recruiters.

Improving recruiter performance continues to be a key to the success of the all-volunteer military. Despite the results obtained in this thesis, with respect to the RSTB's lack of predictive ability of recruiter success, previous studies have shown that the RSTB can be used to aid in the selection of recruiters. Further research (using this sample or the results from additional testing) will be needed before a final determination can be made of the

usefulness of  the RSTB  as a tool for selecting successful
recruiters.

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